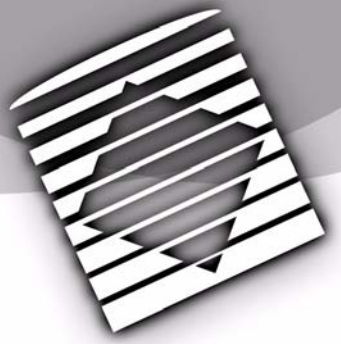

FuelsManager® DEFENSE

User Manual

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Varec®

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Using This Manual

Before reading this manual, users should become familiar with the operation of Microsoft Windows. The primary purpose of this manual is to describe and explain the environment and processes of the FuelsManager operator application.

The most commonly used features of the system are explained by a selection of step-by-step instructions. These instructions will soon become second nature, allowing operators to respond to alarms, run reports and monitor the facility quickly and efficiently.

This manual includes operator instructions for both the Standard and Professional editions of FuelsManager. Please refer to FuelsManager Administrator Manual for information on topics not contained in this document.

It is assumed that the FuelsManager System has already been installed and commissioned. If there is any doubt of the state of the system, operators are advised to contact an Administrator or Supervisor before continuing.

Windows Terminology

FuelsManager operator interface is based upon the Microsoft Windows Graphical User Interface (GUI) standard and is SAA-compliant (System Application Architecture standard for open systems). All top-level menus, dialog boxes and mouse-driven interfaces adhere to the published standards for Microsoft Windows. This manual uses the terms described in the table below when describing operator actions and windows elements for step-by-step instructions.

Actions in Windows

Actions	Description
Point	To move the mouse pointer until it rests on the item of choice
Click	To quickly, press and release the mouse button once
Double-click	To quickly, press and release the mouse button twice in succession
Drag	To hold down the mouse button while moving an object across the computer screen
Release	To quit holding down the mouse button after dragging an item
Select	To pick an item on a menu, button or to highlight text or graphics usually via a single click). Selecting does not initiate an action
Choose	To pick an item to carry out an action. Often needed to select an item before choosing it (usually via a double-click).

Window Elements

Elements	Description
Program Icon	Provides a pop-up menu, which allows window modification.
Title Bar	Shows the title of the application, document or FuelsManager graphic screen
Menu Bar	Lists of available menus. Most applications have a File menu, Edit menu, and a Help menu, as well as menus unique to the application.
Menu	A menu contains a list of commands or actions performed by the operator. Also referred to as a pop-up/drop-down menu.
Dialog Box	A movable window that is displayed on screen in response to the user selecting a menu option. It provides the current status and available options for a particular feature in the application.
Window	A scrollable viewing area on screen. May refer to the entire application in a window.
Window Title	The Window title can be the name of an application, document, group, directory or file depending on the type of window in which it appears.
Close Button	Use this button to close the window or application.
Maximize Button	Use this button to enlarge the application window so that it fills the entire desktop.
Minimize Button	Use this button to reduce the application window to an icon at the bottom of the screen.
Restore Button	This button can restore an application window to its previous size and location.
Window Border	The Window border is the outside edge of a window. The user can change the window size by dragging the border in or out on each side of a window.

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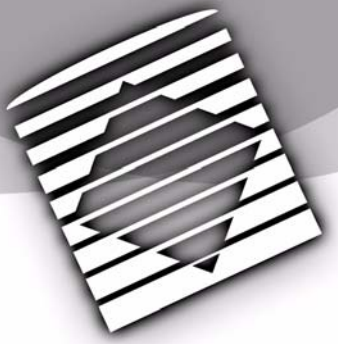


Introduction to FuelsManager Defense

About FuelsManager

FuelsManager is an advanced Inventory Management suite of software products for tank farms, terminals, pipelines and other management facilities. This system runs under the Microsoft Windows 2000 or the Microsoft Windows XP operating systems. These multi-tasking, 32-bit operating systems allow for complete client/server applications. FuelsManager can operate on a single personal computer or as part of a network. In addition, FuelsManager can be networked with other personal computers or host computer systems.

Users are able to integrate all major types of tank level and mass measurement instruments, including float, radar, servo, hydrostatic, magnetostrictive and hybrid tank gauges, into one system. Storage tank parameters, such as level, temperature, gross and net standard volumes are displayed in real-time at the local operator workstation. The system contains fuels management-specific functionality and can communicate with most major manufacturers' tank gauges and other automation equipment. The system can monitor levels, temperatures, alarms, volumes, flow and other variables for up to 2000 tanks.

In addition, FuelsManager is capable of controlling an entire tank farm. Programmable Logic Controllers (PLCs) are used to monitor and control tank farm instrumentation and control devices, such as pumps and valves. Combining tank farm automation with tank farm inventory reduces the number of systems that operators have to manage. Complete control of pipeline receipts, hydrant system control, independent high level alarm systems, Emergency Fuel Shut-Off (EFSO) and interfaces to leak detection systems are all possible with FuelsManager's Tank Farm Automation.

Getting Started with OPERATE

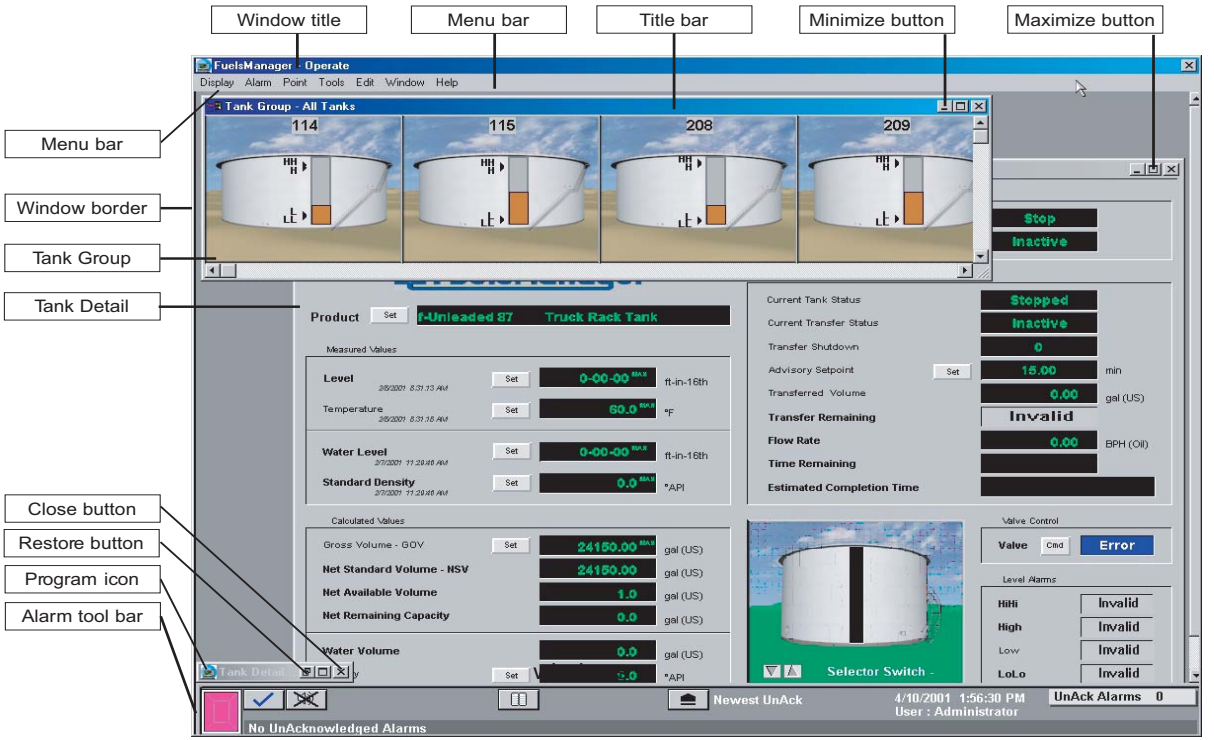
FuelsManager is operated and maintained through the OPERATE program interface. The interface allows the operator to interact with the facility during run-time and provides dynamic interaction with the FuelsManager database. Using FuelsManager OPERATE, the operator can monitor and control equipment through the use of real-time graphics and reports. Also, the operator can manage alarms and view trends.

To get started with FuelsManager OPERATE perform the following operations:

Step-by-Step

- From the Windows Start menu, select Programs.
- Select FuelsManager.
- From the FuelsManager program group select Operate. The FuelsManager OPERATE window appears showing the Index Display graphic.

The following sections briefly describes FuelsManager OPERATE elements and keyboard shortcuts.



OPERATE Window Elements

Element	Description
Menu Bar	The Menu bar displays all available menus, depending on the type of active window. Each menu provides access to the functions necessary to operate the application. (The menu options may change depending on the type of active window.)
Display Menu	This menu enables operators to display different FuelsManager windows, view FuelsManager System communications, Weights & Measures Seals and exit the FuelsManager OPERATE application.
Alarm Menu	The Alarm menu allows operators to silence, acknowledge and view alarm information, such as the number of alarms, the alarm description and alarm priority. Using the log file browser from this menu, operators are also able to view and print all alarms, events and comments for any selected day.
Point Menu	This menu enables operators to continuously monitor any point's variable in the FuelsManager database and have it readily available to issue a command.
Tools Menu	The Tools menu provides a macro option; operators can run the macro and the system automatically performs the graphics-related commands and can prompt operators with the resulting dialog boxes.
Edit Menu	Only available when a Tank Group window is active, this menu allows the user to modify the format and content of the static and dynamic Tank Group displays.
Movements Menu	This menu enables the operator to open the Movement Summary or Movement History windows for creating and operating Product Movements.
Trend Menu	Only available when a Tank Detail window is active, allows the user to configure / view Real-Time and Historical trends for the selected tank.
Window Menu	The Window menu always allows the operator to tile, cascade, arrange icons and close all windows and depending on the selected window the operator is provided with additional functions.

Element	Description
Help Menu	When operators select Help on the Menu bar, a list of Help options appears, which provide access to FuelsManager's online documentation. This is a convenient way to look up information about a task that operators are performing, a feature operators would like to know more about or a command operators want to use. FuelsManager displays online help using Adobe Acrobat Reader v5.1.
Window Displays	There are various types of windows found in FuelsManager OPERATE - Graphic, Report, Historical, Report, Tank Detail, Tank Group, Real-Time Trend and Historical Trend. Each type of window is accessible by selecting the Open command from the Display menu.
Alarm Tool Bar	The Alarm tool bar shown at the bottom of the screen provides the operator with a quick view of any alarm conditions. Operators are also able to easily silence, acknowledge and view alarm information, such as the number of alarms, the alarm description and alarm priority.

Keyboard Shortcuts

Key	Action
F1	Returns user to the Index Display graphic
F2	Opens the Graphic Display Selection dialog box
F3	Opens the Report List Selection
F4	Opens the Database Point Monitor for a previously defined point
F5	Displays the Alarm Summary
F6	Silences alarms
F7	Opens a Tank Detail screen
F8	Opens a Tank Group
F9	Toggles between Graphic and Tabular Tank Group displays
CTRL + F4	Closes the selected window
CTRL + F6 (CTRL + Tab)	Toggles between all open FuelsManager window displays
ALT + Tab3	Toggles between all open Windows applications

Command Summary

Display ¦ Index Display (F1)
Opens the Index Display

Display ¦ Open
Displays a list of submenu commands that allow the user to open various types of windows

Display ¦ Print Display
Allows the user to print the current display

Display ¦ Exit
Exits the FuelsManager OPERATE application

Tools ¦ Macro
Allows the user to record/playback sequences of actions and commands via the Macro dialog box

Tools ¦ Perform Leak Rate Analysis
Allows the user to perform analysis of sensor data for conditions that might indicate a leak, via the Perform Leak Analysis dialog box

Window ¦ Select
Depending on the active window type - Allows the user to open another window of that type

Window ¦ Tile
Tiles all currently open windows

Window ¦ Cascade
Cascades all currently open windows

Window ¦ Arrange Icons
Arranges all icons at the bottom-left of the FuelsManager OPERATE window

Window ¦ Close All
Closes all currently open windows

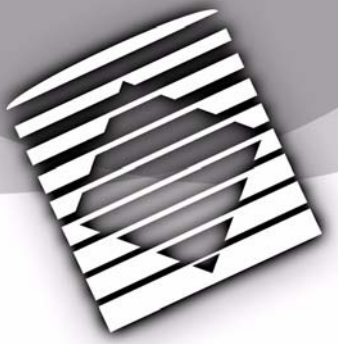
Help ¦ Table Of Contents
Opens this manual in Adobe Acrobat® for online reference at the ‘Table of Contents’ section

Help ¦ Movements
Opens this manual in Adobe Acrobat® for online reference at the ‘Using Product Movement’ section

Help ¦ For Beginners
Opens this manual in Adobe Acrobat® for online reference at the ‘Using This Manual’ section

Help ¦ Menu Commands
Opens this manual in Adobe Acrobat® for online reference at the ‘OPERATE Window Elements’ section

Help ¦ Alarm System Opens this manual in Adobe Acrobat® for online reference at the ‘Alarm Tools’ section
Help ¦ Using Operate Opens this manual in Adobe Acrobat® for online reference at the ‘Getting Started with OPERATE’ section
Help ¦ Keyboard Shortcuts Opens this manual in Adobe Acrobat® for online reference at the ‘Keyboard Shortcuts’ section
About Operate Opens the About FuelsManager dialog box



Working with Individual Tanks

Understanding Tank Details

Each tank within the facility has a corresponding Tank Detail window. The operator is able to see various information for a single tank in these windows.

Tank Detail Fields

Note! Please refer to the 'Tank Detail Description' section for a complete description of fields on the Tank Detail window.

The following pages explain the meaning of the standard fields shown on a Tank Detail window. Since the Tank Detail template is configurable, the Tank Detail may look differently based on the facilities requirements. In addition, FuelsManager can use a different Tank Detail template for different types of tanks, hence, the Tank Detail fields may differ depending on the tank selected.

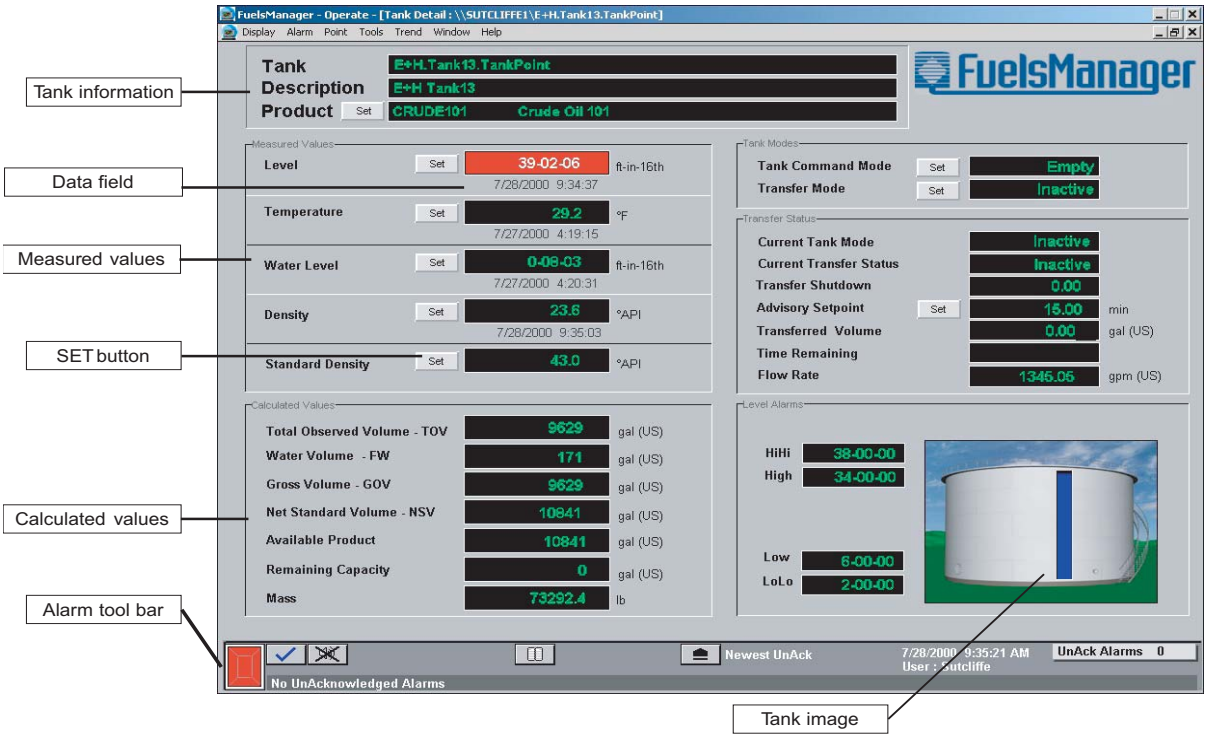
Viewing Tank Details for a Single Tank

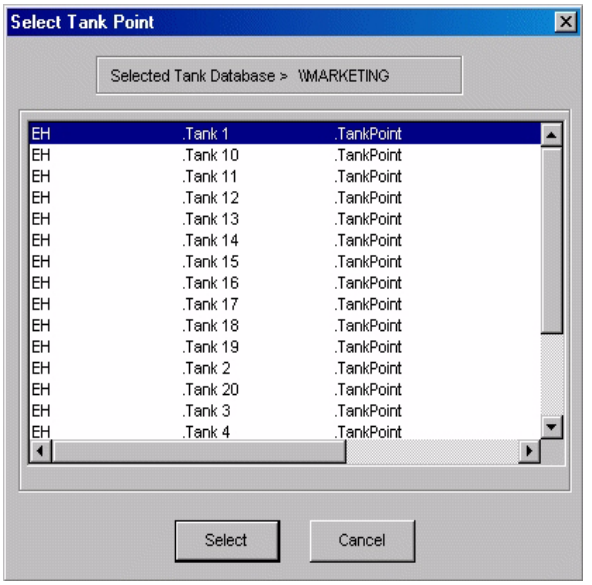
Note! Multiple 'Tank Detail' windows can be opened using these methods.

To view details for a single tank, users must first open the Select Tank Point dialog box. This allows access to all tanks in the current database and enables operators to select an individual tank to view its details. Using a keyboard shortcut is the simplest method available to open this window.

Step-by-Step: Keyboard Shortcut

- Press 'F7' key on the keyboard. The Select Tank Point dialog box appears.





Select Tank Point dialog box

Selecting a Tank Detail to View

Once the Select Tank Point dialog box has been opened, then:

Step-by-Step

- Press ‘F7’ key on the keyboard. The Select Tank Point dialog box appears
- Choose a specific Tank Point to be displayed on screen. The selected Tank Point is highlighted.
- Click Select. The selected Tank Detail window appears.

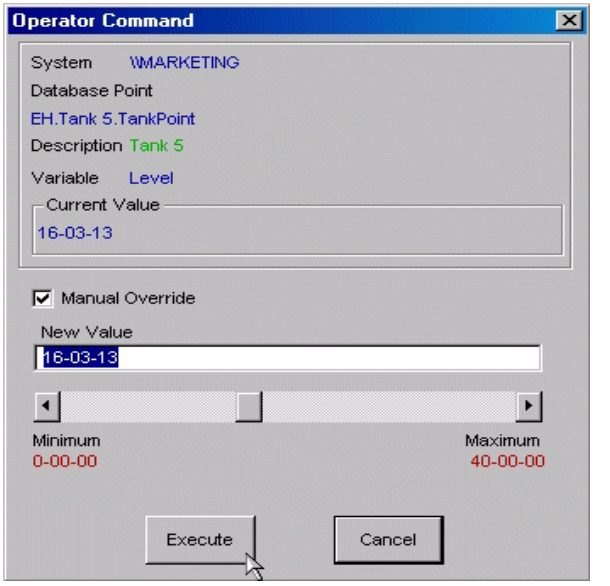
Modifying Tank Parameters

Note! The Operator Command dialog box shows the user current, minimum and maximum values.

On the Tank Detail window, any modifiable tank parameters contains a SET button next to the field. When modifying a tank parameter, the operator has the option of forcing the input data to the entered value. This will, of course, affect the value of any calculated data derived from inputs, which are forced.

Step-by-Step

- Click the appropriate SET button to enter a new value. The Operator Command dialog box appears. This example dialog box lists the attributes of the variable, such as database system, the database point and tank description.
- Change current values by typing the required value in the text box or by sliding the scroll bar.
- Click the Manual Override check box. This overrides the current value in the system.
- Click the Execute button to change the value. The new value is transmitted to the FuelsManager System.

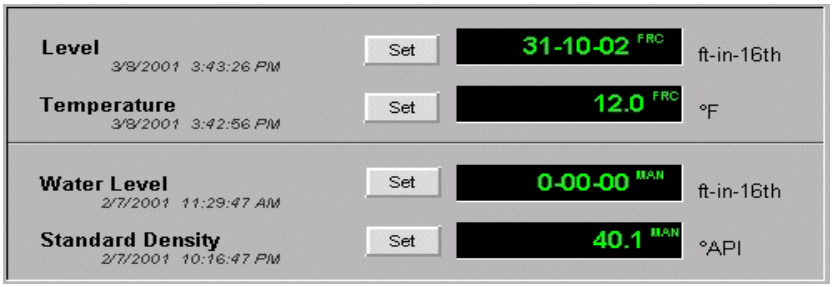


Operator Command dialog box

Overriding a Value

The Manual Override feature is enabled for a value that is receiving data from the field, the operator is able to manually override a database value. These values are denoted by FRC anywhere the database value appears. Other values may be affected by these forced values. These values also contain superscripts indicating the consequence of the forced value. Several example values containing superscripts are shown in the following table.

Superscript values	Description
FRC	Input data has been forced to the current value.
OVR	Input data exceeds maximum value (over range).
UND	Input data falls below minimum value (under range).
CAL	Calculated data has been derived.



A forced value shown in the Tank Detail window

Note! The SET buttons involved in performing a tank transfer are different from the SET buttons mentioned in this discussion. Please see the operations section entitled 'Tank Transfers'.

Tank Calculations

The Calculator command from the window menu allows the operator to perform calculations manually for tank data. This option is useful for performing ‘what if’ type calculations, allowing the operator to see what the level would be if 5000 gallons of product was added to the tank or what volume would be at the high level alarm limit. The results of the calculations are only shown within the Calculator dialog box and not transferred to the Tank Detail.

Opening the Calculator

Note! In order to perform calculations, a Tank Detail window must be displayed and currently active.

Step-by-Step

- Select Window from the Menu bar. A pop-up menu appears.
- Choose Calculations. The Calculator dialog box appears.

Performing a Calculation

Note! Changing values in the Calculator does not affect the existing data found in the Tank Detail window.

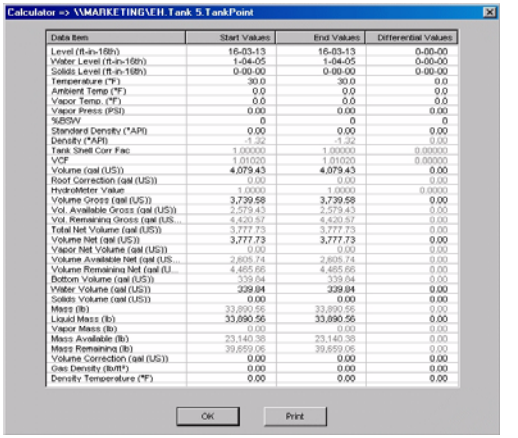
Some values within the calculator cannot be changed. These values appear gray.

Step-by-Step

- Select Window from the Menu bar. A pop-up menu appears.
- Choose Calculations. The Calculator dialog box appears.
- Click on the parameter to be changed. An Operator Command dialog box will be displayed.
- Select or type in the new value.
- Click Execute. The changes appear in the Calculator dialog box.

Note! Operators are able to print out the results of any calculations from the Calculator dialog box.

Changing one parameter value causes all data derived from the parameter to be recalculated, i.e. changing the level parameter will cause all volumes to be recalculated.



Calculator dialog

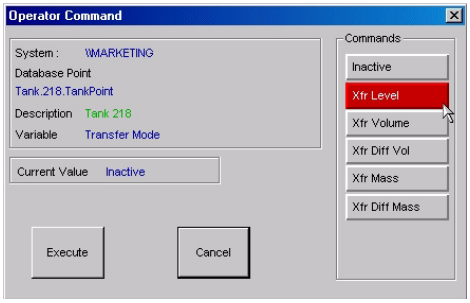
Tank Transfers

FuelsManager OPERATE provides each tank with advisory and transfer shutdown setpoints. During Tank Transfers:

- The database calculates the volume of product transferred and time remaining to transfer completion.
- Operators are notified when the advisory setpoint is reached.
- An operator alarm occurs when the shutdown setpoint is reached, indicating the end of the transfer.

Performing a Tank Transfer

A Tank Transfer can only be configured from the Tank Detail window. To perform a transfer, follow the operations below:



Operator Command dialog box for tank transfers

Note! Clicking execute affect displayed units found in the Advisory and Transfer SD (Shutdown) Setpoint.

Step-by-Step

- Click on the Transfer Mode Set button. An Operator Command dialog box appears. In this dialog box, users can use various methods to transfer product, see the transfer mode command descriptions opposite.
- Select the mode for the Tank Transfer.
- Click Execute.
- Click on the Transfer Shutdown Set button. An Operator Command dialog box appears.
- Select or type in the new tank value.
- Click Execute.
- Click on the Advisory Setpoint Set button. The Operator Command dialog box appears.

Continued...

...Continued

- Select or type in the time. This time is used to set when the Advisory Alarm occurs. Click Execute.
- Click Tank Command Mode Set button. An Operator Command dialog box appears.
- Select the appropriate command and then click Execute. This action begins the transfer process.

Once the Tank Transfer Process is Complete

Step-by-Step

- Click the Transfer Mode button. An Operator Command dialog box appears.
- Select Inactive and click Execute.

Transfer Mode Command	Description
Inactive	Terminates a transfer
Xfr Level	A transfer that is terminated by defined Level.
Xfr Volume	A transfer that is terminated by Stop Total Volume.
Xfr Diff Vol	A transfer that is terminated by the Stop Differential Volume (change in volume).
Xfr Mass	A transfer that is terminated by the Stop Mass.
Xfr Diff Mass	A transfer that is terminated by the Stop Differential Mass (change in mass).

Tank Mode Command	Description
Stop	Stops tank - No movement allowed
Fill	Fills tank - Upward movement only
Empty	Empties tank - Downward movement only
Run	Tank could be Filling/Emptying/Stopped. Mode alarms are disabled
Test	Mode and Operational alarm disabled. Level alarms not affected
Reset	Resets an illegal Movement Alarm Current. Level/Volume are recaptured and movement monitoring begins again based on the new data
Out of Service	Tank is disabled. All alarms are disabled.

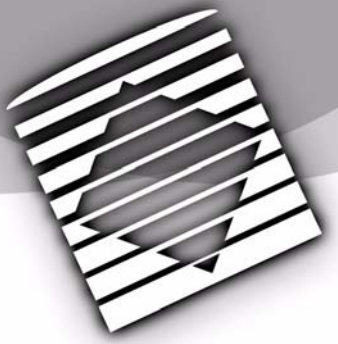
Tank Detail Field Descriptions

Field	Description
Tank	Displays the name of the tank.
Description	Displays the description of the tank.
Product	Displays the product and product description contained in the tank.
Level	Displays the current level of the tank.
Level Time	Displays the last time that the tank level was updated.
Temperature	Displays the current temperature of the tank.
Gross Volume	Total measured volume of the product, corrected for Water Level, % BSW, and Roof Volume. This is calculated from the tank gauge reading and the tank-strapping table.
Net Standard Volume	The corrected volume of the product in the tank. This is calculated by multiplying the Gross Volume by the Volume Correction Factor.
Net Available Product.	Net Volume of product that can safely be issued from the tank. This is calculated by subtracting the Net Standard Volume at the minimum working level from the current Net Standard Volume.
Net Remaining Capacity	Net Volume of product that can be added to the tank. This is calculated by subtracting the current Net Standard Volume from the Net Standard Volume at the maximum working level.
Density	Displays the current observed density of the product at the current temperature.
Density Time	The last time that the Density value was updated.
Standard Density	Displays the density of the product corrected to the standard temperature as defined by the selected correction method.
Mass	Displays the product mass based on density.
Water Level	Displays the level of water (if any) in the tank.
Water Volume	The volume calculated from the strapping table at the water level.
Flow Rate	The rate of movement based on consecutive level readings. Calculated from the change in volume and the time interval between scans of the tank level.

Field	Description
Tank Command Mode	The desired mode of the tank operation: stop, fill, empty, run, test, reset, or out of service.
Tank Status	The actual direction of product flow into or out of a tank. The current state of the tank mode: stopped, filling, emptying, running, testing, or disabled.
Transfer Mode	How the transfer is measured: inactive, level, mass, volume or by differential volume or mass.
Transfer Status	The current status of a transfer; displays In Progress, Advisory, or Complete. If there is no active transfer for the tank, the status is Inactive.
Transfer Shutdown Setpoint	Displays the desired ending point of a tank transfer.
Advisory Setpoint	The time that a transfer alarm should be triggered. Can be from 0-120 minutes before the transfer reaches the Transfer SD Setpoint.
Transferred Volume	The amount of volume transferred into or out of a tank during the tank transfer, or the amount transferred thus far if a transfer is active.
Time Remaining	The time left to complete an active transfer, based on the amount left to transfer, and the current flow rate.
HiHi Alarm	The limit for a high-high level alarm. If the tank level exceeds the HiHi Alarm, then an alarm ensues.
Hi Alarm	The limit for a high level alarm. If the tank level exceeds the Hi Alarm, then an alarm ensues.
Lo Alarm	The limit for a low level alarm. If the tank level drops below the Lo Alarm, then an alarm ensues.
LoLo Alarm	The limit for a low-low level alarm. If the tank level drops below the LoLo Alarm, then an alarm ensues.

Command Summary

Display ¦ Open ¦ Tank Detail (F7) Allows the user to select a Tank Detail to open
Display ¦ W&M Tag Seals Allows the user to view the seal status for Weights & Measures approved tanks
Display ¦ Communications Allows the user to view the communication status of all OPERATE screens
Point ¦ Define Allows the user to select a Database Point to monitor
Point ¦ Open Restore (F4) Opens/Restores the Database Point Monitor
Point ¦ Close Window Closes the Database Point Monitor
Point ¦ Minimize Minimizes the Database Point Monitor
Window ¦ Calculations (Only available when a Tank Detail screen is open) Allows the user to perform and print 'What if' calculations



Working with Multiple Tanks

Understanding Tank Groups

FuelsManager OPERATE provides the user with two different ways of viewing Tank Group information: a Static Group or a Dynamic Group.

Static Tank Groups

These are combinations of tanks selected from the current database. The tanks included in each static group will be pre-configured when the system is installed, although the operator may also add/delete tanks to/from groups or create completely new groups. The tanks included in static groups remain constant unless a tank is added, inserted or deleted manually.

For example, generally all Static Tank Groups will be based on the location of the tanks - Static Tank Group 1 = all tanks displayed from West tank farm.

Dynamic Tank Groups

As their name suggests, Dynamic Tank Groups can constantly change. They are made up of tanks with characteristic limits defined by the operator. Any tank with a characteristic that fits within these limits will be added to the Tank Group. Any tank within the database, but outside the limits, will not be displayed.

For example, Dynamic Tank Groups are made up of tanks that fit defined characteristics - e.g. Dynamic Tank Group 1 = all tanks on a facility that have a temperature above 40° degrees.

Graphical and Tabular Based Window Displays

FuelsManager OPERATE also provides two (2) ways to display Static and Dynamic Tank Groups. The operator is able to see graphical information overlayed onto tank images or a text information in a table form. Both types of windows provide access to the same process data and allow the operator to:

- View the Process Data of any tank
- Display multiple tanks per page in any order
- Add and delete existing displays
- Add and delete existing entries
- Change the value of tank variables
- Access the Tank Detail window for any selected tank

Opening a Tank Detail Window from a Tank Group Window

Operators can easily view a Tank Detail if a Tank Group window is currently active.

Step-by-Step: Option 1

- From the Tabular Tank Group window, double-click on a real-time data field for the Tank Detail to be opened. The selected Tank Detail window appears.

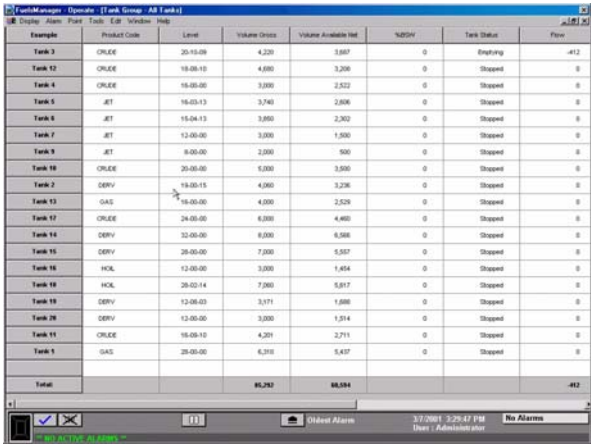
Step-by-Step: Option 2

- From the Graphical Tank Group window double-click on a tank image for the required Tank Detail. The selected Tank Detail window appears.

Note! Use the 'F9' key on the keyboard to toggle between a tabular based view and a graphical view of a Tank Group.

Both Graphical and Tabular based windows allow the operator to customize the information displayed using modify, add, insert, clear or delete commands.

Graphical Tank Group



Tabular Tank Group

Viewing a Tank Group

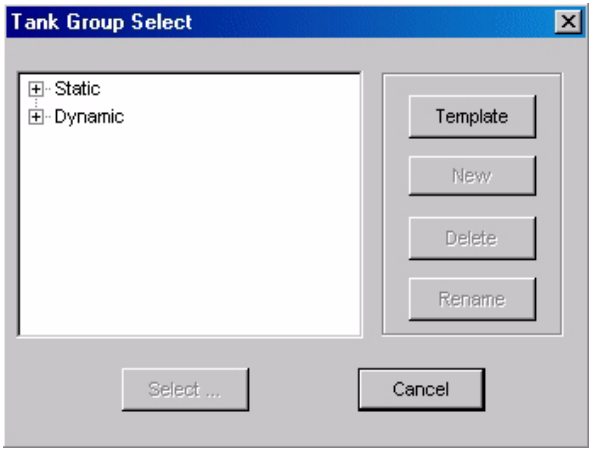
To view details for multiple tanks, operators must first open the Tank Group Select dialog box.

Opening a Tank Group

This shows all Tank Groups in the current database and enables operators to select a group of tanks to view. Open this window using a keyboard shortcut:

Step-by-Step: Keyboard Shortcut

- Press ‘F8’ key on the keyboard. The Tank Group Select dialog box appears



Tank Group Select dialog box

The operator has a number of options from this dialog box, such as:

- Create a template that the Tank Group display uses
- Create a new Tank Group
- Delete any Tank Group
- Rename any Tank Group

Selecting an Existing Static Tank Group to View

From the Tank Group Select dialog box operators are able to create new Tank Groups or view existing Tank Groups. In this example, we will view an existing Tank Group. The dialog box provides two choices, Static or Dynamic. The system will have a number of pre-defined groups. To view these, operators must first expand the tree structure of the Static Groups

Note! When a Tank Group is selected, the group appears on screen in the same format as the last viewed Tank Group, either Tabular or Graphically based.

Step-by-Step

- Click on the box with the '+' sign to the left of Static. The tree structure expands to show the predefined Tank Groups.
- Choose the desired Tank Group. The choice is highlighted.
- Click the Select button or double-click on the tank. The selected Tank Group window appears.

Selecting an Existing Dynamic Tank Group to View

From the Tank Group Select dialog box, operators must first expand the tree structure of the Dynamic Group to see the available choices of Dynamic Groups.

Step-by-Step

- With the mouse click on the box with the '+' sign to the left of Dynamic. The tree structure expands to show the predefined Tank Groups.
- Choose the desired Tank Group. The choice is highlighted.
- Click the Select button or double-click on the tank. The selected Tank Group window appears.

Opening Multiple Tank Groups

FuelsManager OPERATE allows operators to open multiple Tank Group windows. To do this, simply repeat the previous instructions.

Graphical Tank Group Display

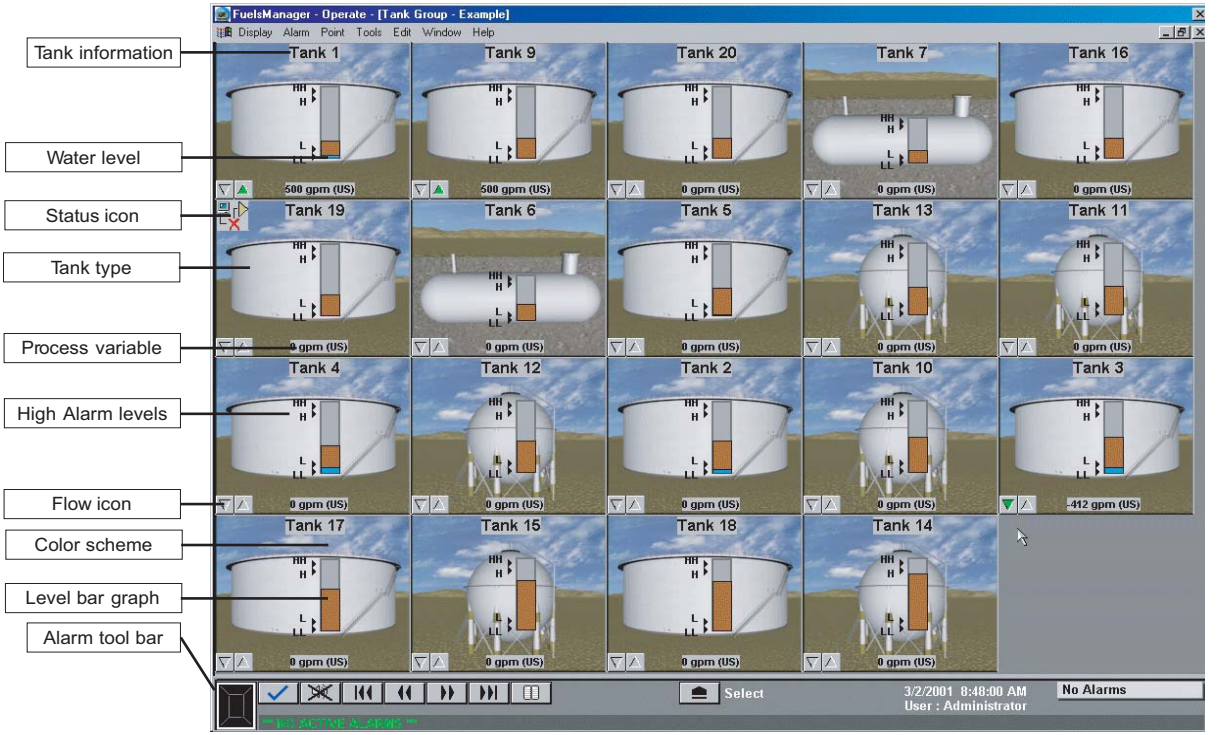
The operator can place up to 105 tanks on a single Static Tank Group at one time. However, an unlimited amount of tanks may be added for a Dynamic Tank Group. Each tank is represented by a realistic, three-dimensional graphic showing the tank size and shape. Overlayed onto these tank images, the operator can select various amounts of information to be displayed, such as:

- Product Level
- Alarm Level
- Tank Description and Number
- A single Process Variable
- Flow
- Tank Status
- Water Level

Note! Any changes made to the Graphical Tank Group window will also be made to the Tabular Tank Group window.

Step-by-Step: Keyboard Shortcut

- At any point, the operator may use the ‘F9’ key on the keyboard to toggle between a text based view and a graphical view of a Tank Group.



Using Menu Commands from the Graphical Tank Group

The operator can modify the contents of a Graphical Tank Group window using the Edit and the Tank Group menus. The Edit menu is available from the Menu bar at the top of the screen and provides a number of options for the operator. Some menu items are unavailable when the Graphical Tank Group display is active. These items appear grey. The Tank Group menu is available by right-clicking on a tank from the Graphical Tank Group window.

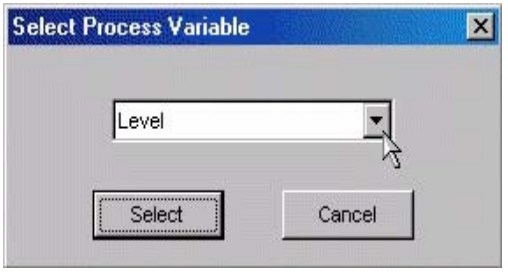
Right-click on a tank to use the Tank Group menu

Displaying a Process Variable

A single Process Variable can be displayed below the tank. This variable is the same for each tank in the display.

Step-by-Step

- Select Edit menu from the Menu bar.
- Select ‘Select Alt View Process Variable’. The Select Process Variable dialog box appears.
- From the drop-down menu, select the desired variable to display.
- Click Select. The Process Variable is shown at the bottom of each tank in the display.



Select Process Variable dialog box

Selecting a Background Color Scheme

FuelsManager OPERATE allows operators to choose from the following background color schemes:

- Green grass with sky
- Sand with sky
- Earth with sky

Step-by-Step

- Select Edit menu from the Menu bar.
- Select ‘Select background Scheme’. The Select Tank Background dialog box appears.
- Check the box below the desired background.
- Click OK. The background scheme for all tanks changes to the selection.

Showing Tank Information

Using the Edit menu, FuelsManager OPERATE allows operators to display the following tank information as values or icons on the tank image:

- Flow
- Tank Status
- Water Level
- Point Description

Hiding the Display Flow Icon

Step-by-Step

- Select Edit menu from the Menu bar.
- Move the mouse to highlight Display Flow and click.
- The icon on each tank image is removed.
- If the Edit menu is selected again, the check mark to the left of Display Flow has also been removed, indicating this value or icon is not displayed.

Note! In the Edit menu a check is displayed next to each of these commands to indicate to the operator that the value/icon is displayed on the Tank Group.

Edit menu from Menu bar

Obtaining Additional Operator Information

Various percentage values can be obtained directly from the Tank Group window, such as:

- Current Product Level
- Current Water Level
- Current Alarm Indication Levels
- Product Flow

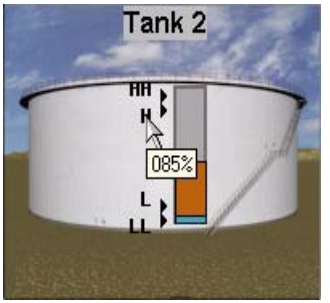
Step-by-Step

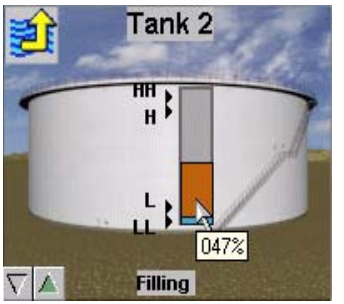
- Move the mouse over the bar graph.
- A box appears showing the current level as a percentage value.
- Move the mouse over the letters indicating an alarm level, e.g. High Level alarm (H).
- A box appears showing the percentage value of contents in the tank at which a High Level alarm will occur.

A tank as shown in the Tank Group window displaying -

Left - Current High Level Alarm Setpoint as a percentage value

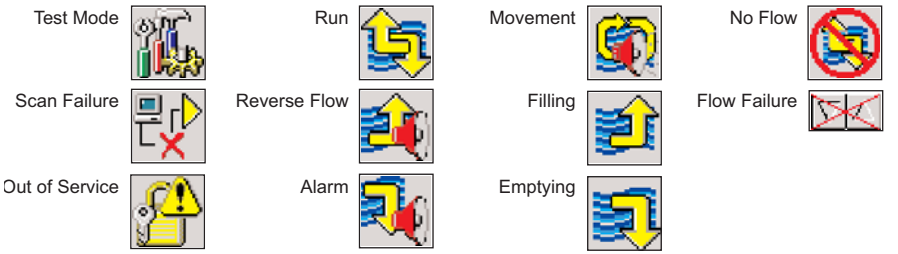
Right - Current level as a percentage value





Tank Status Icons

Depending on the status of the tank, additional information may be displayed to the operator using icons in the top left corner of each tank image.



Changing the Number of Tanks Displayed

The operator can easily modify the tanks displayed in a Graphical Tank Group using the Tank Group menu. The commands included in the Tank Group menu include:

- Modify/Add Tank
- Insert Tank
- Delete Tank
- Clear Tank

Deleting a Tank from a Tank Group Display

In this example the operator can decrease the number of tanks displayed.

Step-by-Step

- Right-click anywhere on the specific tank that is to be removed from the display. The Tank Group menu appears.
- Select Delete Tank. The tank is removed from the group.
- Press ‘F9’ to toggle to the text Tank Group window. On the text Tank Group, the tank has also been removed.
- Press ‘F9’ to toggle back to the Graphical Tank Group window.

Modifying Tanks on a Graphical Tank Group

The operator can use the step-by-step operations shown above for deleting a tank for the other Tank Group menu commands to change the Tank Group window.

Modifying Tank Variables from a Graphical Tank Group

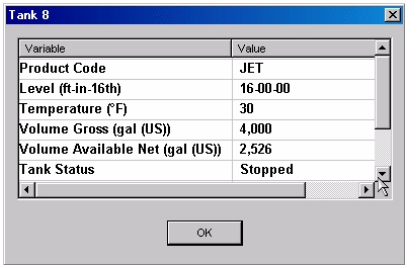
Individual tank variables can be modified from the Tank Group window in a similar way to modifying variables from the Tank Detail window. When modifying a tank variable, the operator has the option of forcing the data to the entered value. This will, of course, affect the value of any calculated data derived from inputs which are forced.

Note! The Tank Group menu also allows the operator to access Tank Details and modify Process Data for individual tanks.

To modify variables, the operator will first need to open the Process Data dialog box.

Step-by-Step

- Right-click anywhere on the specific tank that is to be modified. The Tank Group menu appears.
- Select the Process Data command. The Process Data dialog box appears showing variables and associated values for the tank selected.



The Process Data dialog box

Changing the Product Code for a Tank

Note! Modifying tank variables in the Tank Group changes the values in the Tank Detail.

Continuing from the instructions above, with the Process Data dialog box open:

Step-by-Step

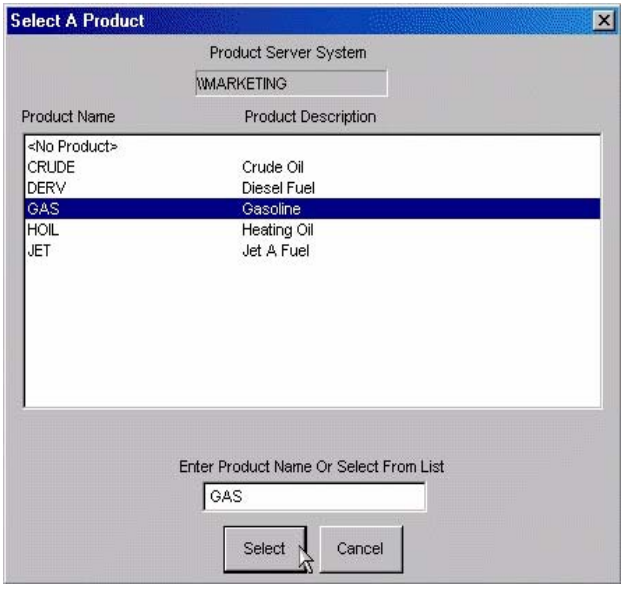
- Double-click anywhere on the product code row. The Select A Product dialog box appears.
- Select a product from the list. The product selected is highlighted and the product name appears in the text box.
- Click Select. The product in the tank is changed to the newly selected product.

Changing a Tank Variable

Continuing from the instructions above, with the Process Data dialog box open:

Step-by-Step

- Double-click anywhere on the variable row that is to be changed. The Operator Command dialog box appears. This example dialog box lists the attributes of the variable, such as the database point, tank description and value.
- Change current values by typing the required value in the text box or by sliding the scroll bar.
- Click the Manual Override check box. This over rides the current value in the system.
- Click the Execute button to change the value. The new value is transmitted to the FuelsManager System.

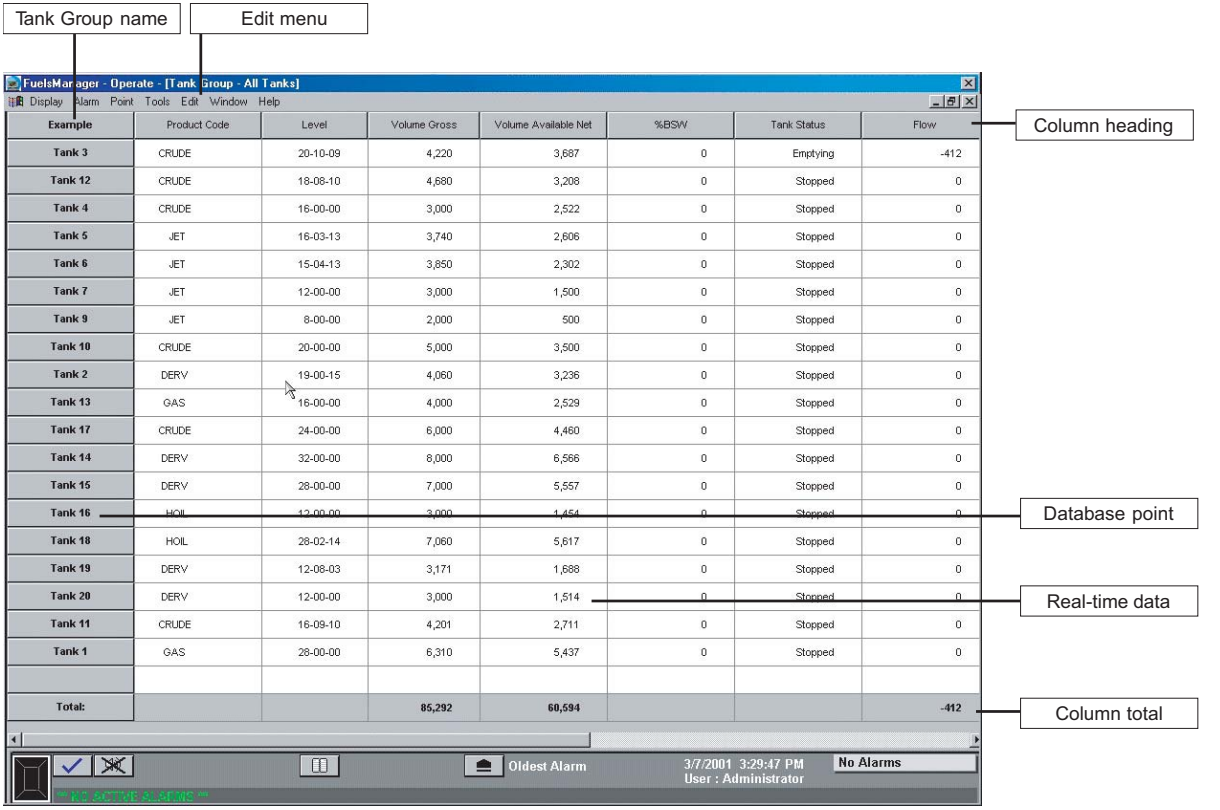


Select A Product dialog box

Tabular Tank Group Display

From this window, operators can view relevant tank information as well as modify, add, insert, clear, or delete tank points and columns. Operators can also access a Tank Detail for a selected point. There are five elements to this window:

- Tank Group Name
- Column Headings
- Real-Time Data
- Column Totals
- Database Points



Example	Product Code	Level	Volume Gross	Volume Available Net	%BSW	Tank Status	Flow
Tank 3	CRUDE	20-10-09	4,220	3,687	0	Emptying	-412
Tank 12	CRUDE	18-08-10	4,680	3,208	0	Stopped	0
Tank 4	CRUDE	16-00-00	3,000	2,522	0	Stopped	0
Tank 5	JET	16-03-13	3,740	2,606	0	Stopped	0
Tank 6	JET	15-04-13	3,850	2,302	0	Stopped	0
Tank 7	JET	12-00-00	3,000	1,500	0	Stopped	0
Tank 9	JET	8-00-00	2,000	500	0	Stopped	0
Tank 10	CRUDE	20-00-00	5,000	3,500	0	Stopped	0
Tank 2	DERV	19-00-15	4,060	3,236	0	Stopped	0
Tank 13	GAS	16-00-00	4,000	2,529	0	Stopped	0
Tank 17	CRUDE	24-00-00	6,000	4,460	0	Stopped	0
Tank 14	DERV	32-00-00	8,000	6,566	0	Stopped	0
Tank 15	DERV	28-00-00	7,000	5,557	0	Stopped	0
Tank 16	HOIL	12-00-00	3,000	1,454	0	Stopped	0
Tank 18	HOIL	28-02-14	7,060	5,617	0	Stopped	0
Tank 19	DERV	12-08-03	3,171	1,688	0	Stopped	0
Tank 20	DERV	12-00-00	3,000	1,514	0	Stopped	0
Tank 11	CRUDE	16-09-10	4,201	2,711	0	Stopped	0
Tank 1	GAS	28-00-00	6,310	5,437	0	Stopped	0
Total:			85,292	60,594			-412

Modifying Information Displayed in the Tabular Tank Group

The user is able to modify the content and format of a Tabular Tank Group window directly from the window in five ways.

Step-by-Step

- Right-click on the Tank Group name cell. The Tank Group Name menu appears.
- With the mouse right-click on any Column Headings cell. The Column Heading menu appears.
- Right-click on any Real-Time Data value. The Real-Time Data menu appears.
- Right-click on any Database Point. The Database Point menu appears.
- From the Menu bar select the Edit menu.

Using the commands from these five menus gives the operator a large amount of flexibility to the format and content of a tank view. The following sections briefly describe the commands and provide some step-by-step examples of operation.

Tank Group Name

This field displays the unique Tank Group name assigned by the user. The Tank Group name can be any combination of numbers, upper or lowercase characters, spaces, or other punctuation marks, up to a maximum length of 30 characters. (The Tank Group name cannot include any of the following characters: forward slash (/), backslash (\), comma (,)).

Setting the Number of Database Levels to Be Displayed

The operator can select the number of FuelsManager database levels to be displayed in the left hand column of the Tank Group. i.e. A typical FuelsManager database tagname looks like:

Area1.Tank123.TankPoint

Where:

TankPoint is database Level 0

Tank123 is database Level 1

Area1 is database Level 2

Database Level 3 does not exist in this example.

Note! The Column Header Alias dialog box also has a reset button that sets the column heading text back to the default FuelsManager Variable text.

Step-by-Step

- Right-click on the Tank Group name cell. The Tank Group Name menu appears.
- Select Set database Levels. The Database Level Display Configuration dialog box appears.
- Selecting the check boxes allows users to set which level, or combination of levels to be displayed in the left hand column of the Tank Group window.
- Click OK. The format of the database levels changes according to the selection.

Configuring Columns on Tabular Display

All column headings are user configurable. Using the Column Heading menu, operators can modify, add, insert or delete columns, as well as display column format, change units and select column title aliases. Depending on the contents of the column some commands may not be available.

Modifying the Column Header Alias

From this dialog box, operators can change the text displayed for the selected Tank Group column heading. Changing the Column Header Alias only affects the displayed group and does not change the template.

Step-by-Step

- Right-click on the column heading to be modified. The Column Heading menu appears.
- Select Header Alias. The Column Header Alias dialog box appears.
- In the text box, type the new Tank Group column heading.
- Click OK.

Modifying the Column Format

From Set Column Format dialog box, operators can:

- Use the Precision text box to set the number of digits to the right of the decimal point in the column.
- Use the Field text box to set the number of digits to the left of the decimal point in the column.

Note! Changing the format of a column only affects the displayed group and does not change the template.

Note! If the data to be displayed is bigger than the size entered in the Field and Precision fields, the data will be displayed as ###### in the Tank Group window

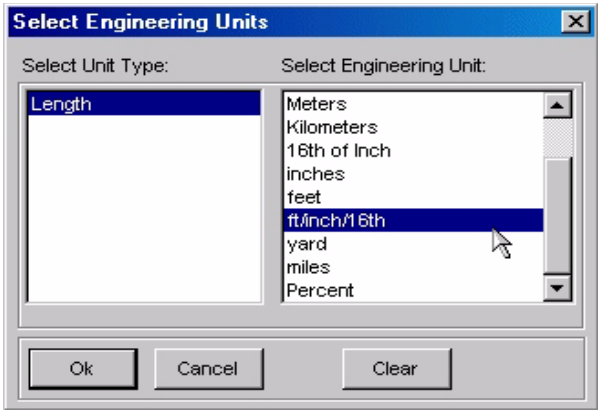
Step-by-Step

- Right-click on the column heading to be modified. The Column Heading menu appears.
- Select Display Format. The Column Header Alias dialog box appears.
- In the text box fields enter the required values.
- Click OK. The changes are applied to the column.

Selecting and Displaying Engineering Units

The Select Engineering Units dialog box, which is available from the Column Heading menu allows the operator to set the engineering units to be used for the selected Tank Group column. The operator is provided with a number of options from this dialog box, such as:

- A list box displaying the available engineering units applicable to the column selected.(i.e. Temperature, Level, Volume, etc.). FuelsManager automatically selects the appropriate unit type based on the tank variable column selected.
- The Clear button resets the engineering units for the selected column to the default engineering units configured for the tank.



Select Engineering Units dialog box

Deleting a Column from a Tank Group

In this example the operator can delete a column from a Text Tank Group window.

Step-by-Step

- Right-click on the column heading to be modified. The Column Heading menu appears.
- Select Delete Column command. The column selected is deleted from the view.

Modifying, Adding and Inserting Columns

The operator can modify, add or insert a column into the Tank Group, each command is available from the Edit menu on the Menu bar or by using the Column Heading menu. These commands access the Select Point Variable dialog box that presents the operator with a list of variables. Selecting a variable from the list will modify, add or insert a column of that type.

Note! When a column is inserted into a table, the new column is placed to the left of the initial selection. Adding a column places the new column at the end of the group (to the right). Modifying a column will replace the currently selected column with the new variable data.

Cells in a Tank Group Display

Each Tank Group cell displays the current data of the particular tank variable (as indicated by the column heading). Changing the column variable will change the data within that column, the operator can also modify individual cells manually.

Changing a Tank Variable in a Tank Group Cell

To manually change a tank variable in a Tank Group cell perform the following operation:

Step-by-Step

- Right-click on the real-time field to be modified. The Real-Time Data menu appears.
- Select Set. The Operator Command dialog box appears. This example dialog box lists the attributes of the variable, such as the database point, tank description and value.
- Change current values by typing the required value in the text box or by sliding the scroll bar.
- Click the Manual Override check box. This over rides the current value in the system.
- Click the Execute button to change the value. The new value is transmitted to the FuelsManager System.

Changing the Font Size in the Tabular Tank Group

Note! The font size in a Tank Group window has a maximum and minimum value. Changing the font size beyond these values will have no effect.

The font size for all elements of the Tank Group display can be increased or decreased.

Step-by-Step

- Right-click on any cell in the Tank Group. The Real-Time Data menu appears.
- Select Increase Font Size (or Decrease Font Size). The font is changed according to the selection.

Total and SubTotal Rows

The FuelsManager configurable Tank Group supports the selective totals of columns via a Total row placed at the bottom of the display or at a fixed position. Fixing the position of the Total row allows it to remain visible when the operator scrolls past the allowable 20 tanks per page. In addition, Static Tank groups support SubTotal rows that can be used to provide sub-totalization of user defined tanks.

Calculating a Column Total and SubTotal

To calculate a total or subtotal sum for a particular column, perform the following operation:

Step-by-Step

- Right-click on the column heading to be modified. The Column Heading menu appears.
- Select Column Total. The sum of values is shown in the Total and/or SubTotal rows.

Selecting the Location of the Total Row

The location of the Total row can be moved so that the operator can always see on screen the total values or it can be placed at the bottom of all rows.

Step-by-Step

- Right-click on the Database Point after the Database Point where the Total row is to be positioned. The Database Point menu appears.
- Select Set Total Position. The Total row is now inserted into position above the Database Point selected.

Freezing the Total Row

To freeze the position of the Total row perform the following operation:

Note! If Freeze Total Row is set, then the SubTotal Position will be disabled from the Database Point menu. If SubTotal Position is set, then Freeze Total Row will be disabled from the Database Point menu.

Step-by-Step

- After positioning the Total row to a desired location on the Tabular Tank Group grid, right-click on the Total row. The Database Point menu appears.
- Select Freeze Total Row. The Total row will remain at the set position when the operator scrolls past the allowable 20 tanks per page

Selecting the Location of the SubTotal Row

The location of the SubTotal row can be inserted to allow the operator to quickly see the sub-totalization of user defined tanks.

Note! Subtotals can only be inserted from a clear tank row.

For example, tanks 1-5 contain gasoline and tanks 5-10 contain crude, the operator could build a static tank group that included tanks 1-5 followed by a SubTotal row, then tanks 5-10 followed by a SubTotal row then a space and a final Total row. This tank group would allow operator to quickly see the total gasoline, the total crude supply and the overall site product totals on a single display.

Step-by-Step

- Right-click on the clear row following the tank group row(s) where the SubTotal row is to be positioned. The Database Point menu appears.
- Select SubTotal Position. The SubTotal row is now inserted into position below the tank group row(s).

Changing the Number of Tanks Displayed

The operator can easily modify the tanks displayed in a Tabular Tank Group using the Database Point menu. The commands included in the Database Point menu include:

- Modify/Add tank
- Insert tank
- Delete tank
- Clear tank

Deleting a Tank/Row from a Tabular Tank Group

In this example the operator can decrease the number of tanks displayed.

Step-by-Step

- Right-click on the Database Point to be delete. The Database Point menu appears.
- Select Delete Tank/Row. The tank row is removed from the group display.
- Press ‘F9’ to toggle to the Graphical Tank Group window. On the Graphical Tank Group, the tank has also been removed.
- Press ‘F9’ to toggle back to the Configurable Tank Group window.

Modifying Tabular Tank Group

The operator can use the step-by-step operations shown above in the same way for the other commands on the Database Point menu, thereby editing the Tank Group display.

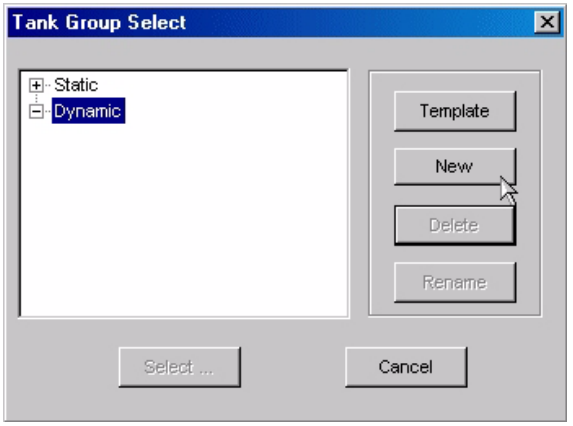
Dynamic Tank Groups

Dynamic Groups, as their name suggests, can constantly change. They are made up of tanks with criteria defined by the operator. Any tank with a characteristic that fit these criteria will be added to the Tank Group. Any tank in the database with variables outside the criteria will not be displayed.

For example, dynamic Tank Groups are made up of tanks that fit defined characteristics - Dynamic Tank Group 1 = all tanks on a facility that have a temperature above 40° degrees.

To view details for multiple tanks, operators must first open the Tank Group Select dialog box. The operator has a number of options from this dialog box, such as:

- Create a template that the Tank Group display uses
- Create a new Tank Group
- Delete any Tank Group
- Rename any Tank Group



Tank Group Select dialog box

Creating a new Dynamic Tank Group

From the Tank Group Select dialog box, operators must first select the type of Tank Group to be work with before the option buttons are accessible.

Step-by-Step

- Press the ‘F8’ key on the keyboard. The Tank Group Select dialog box appears.
- Click on the box with the ‘+’ sign to the left of Dynamic. The tree structure expands to show the pre-defined Tank Groups. The New option button becomes available.
- Click the New button. A New Tank Group Name dialog box appears.
- Type in the desired name for the Tank Group.
- Click OK. A new Tank Group window is opened.

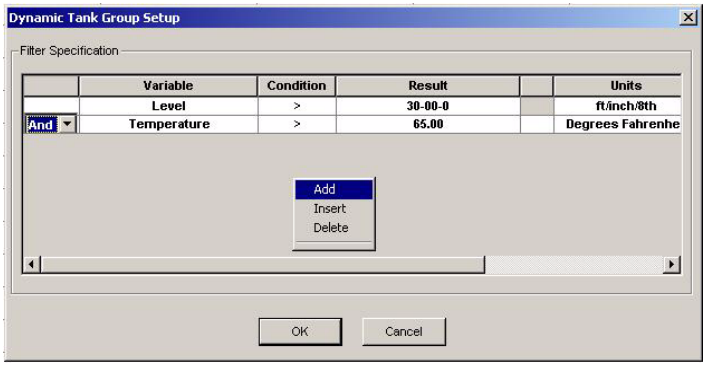
Note! New Tank Groups, Static or Dynamic, are created with column heading set from a predefined template.

Note! Dynamic Tank Group columns can be modified in the same way as Static Tank Groups to show the required real-time data.

All new Tank Groups are initially blank. The operator must add database points to a Static Tank Group or designate a filter setup for a Dynamic Tank Group.

Designate a Filter Setup for a Dynamic Tank Group

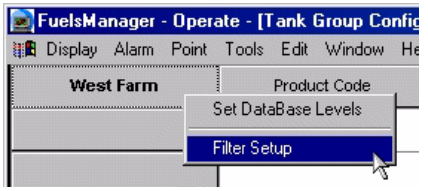
The operator must first select a number of parameters for FuelsManager OPERATE to filter tanks into the Tank Group. Filter specifications include:



Field	Description
Filter Setup Menu	If user rights clicks within the Dynamic Tank Group Setup dialog box, the Filter Setup menu will display with Add, Insert and Delete capabilities.
Conditional Expression	This is where the user will open a bracketed expression.
Variable	Tank Variables that can be setup for filtering.
Condition	The conditions that can be setup for filtering: >- Greater Than <- Less Than =- Equal To >=- Greater Than or Equal To <=- Less Than or Equal To <> Not Equal To
Result	The result available for filtering will be based on the variable selected in the Variable field. For absolute values, there will not be a dropdown list. However, there will be an edit field.
Close Conditional Expression	This is where the user will close a bracketed expression. Available options are: ‘)’ or ““

Unit	Allows user to select the units for the number entered or a percent. This field is only available for numbered variables. This field will be populated with the available units for the variables selected and will be disabled for variables that do not have units.
Deadband	The deadband of the result in the selected unit result.

In the example below, the operator needs to view all tanks from the current database with a level greater than 30 ft. The operator would utilize the Filter Setup to query the database for this information.



Tank Group Name menu after right-clicking the Tank Group Name cell.

Step-by-Step

- Right-click on the Tank Group Name cell. The Tank Group Name menu appears. (Option 2: Select the Edit menu from the Menu bar).
- Select Filter Setup. The Dynamic Tank Group Setup dialog box appears.
- Click in the Variable cell. A drop-down menu appears with a list of variables to choose from.
- Select Level. Level is now the selected variable.
- Click in the Units cell. A drop-down menu appears with a list of units to choose from.
- Select ft./inch/16th. ft./inch/16th is now the selected unit. The format of the Result and Deadband cells changes to the format of the selected units.
- Click in the Condition cell. A drop-down menu appears with a list of symbols to choose from.
- Select the Greater Than (>) symbol. Greater Than is now the selected condition.
- Change the value in the Result cell (00-00-00) to read 30 feet (30-00-00).
- Click OK. The Tank Group window now contains all tanks from the database with a level greater than 30 feet.

Note! During normal operations, if a tanks level rises above or falls below 30 feet, that tank will be added or removed from this Dynamic Tank Group display.

Refining a Dynamic Tank Group Selection

A Deadband value can be used when configuring the Filter Setup for any Dynamic Tank Group. Continuing from the example above, the operator may only wish to see tanks within 5 feet 6 inches of the 30 feet value.

Step-by-Step

- Right-click on the Tank Group Name cell. The Tank Group Name menu appears.
- Select Filter Setup. The Dynamic Tank Group Setup dialog box appears with the current values for the Dynamic Tank Group still in place.
- Scroll to see the Deadband column cell and modify this value (00-00-00) to read 5 feet 6 inches (5-06-00). The Tank Group window dynamically changes to contains all tanks from the database with a level within 5 ft. 6 Inches of 30 feet.

Command Summary

Display ¦ Open ¦ Tank Group (F8)
Allows the user to select a Tank Group to open

Edit Menu
Only available when the Tank Group window is active

Edit ¦ Modify Column
Allows the user to change the currently displayed variable in the selected column

Edit ¦ Add Column
Allows the user to add a column to the right of all existing columns in a Tabular Tank Group

Edit ¦ Insert Column
Allows the user to insert a column to the left of the currently selected column in a Tabular Tank Group

Edit ¦ Delete Column
Deletes the selected column in a Tabular Tank Group

Edit ¦ Modify/Add Tank
Allows the user to change the currently selected tank in a Tabular Tank Group

Edit ¦ Insert Tank
Allows the user to insert a Tank above the currently selected row in a Tabular Tank Group

Edit ¦ Delete Tank/Row
Deletes a tank, moving all tanks up one row to fill the space

Edit ¦ Clear Tank
Clears a tank leaving all tanks in the original positions, creating a blank row / position

Edit ¦ Display Format
Allows the user to change the numeric format for data in the selected columns

Edit ¦ Select Units
Allows the user to select the required engineering units for the selected column. All values will be converted to the selected engineering units.

Edit ¦ Increase Font Size
Increases the font size throughout the Tank Group

Edit ¦ Decrease Font Size
Decreases the font size throughout the Tank Group

Edit ¦ Header Alias
Allows the user to customize or reset the currently selected column heading in a Tabular Tank Group

Edit ¦ Filter Setup
Allows the user to define the criteria for a Dynamic Tank Group

Edit ¦ Select Alt View Process Variable
Allows the user to view additional process data from the Graphical Tank Group

Edit ¦ Select Background Scheme
Allows the user to select the background color scheme for a Graphical Tank Group

Edit ¦ Display Flow
Toggles the display of the flow icon on a tank group image for a Graphical Tank Group

Edit ¦ Display Tank Status
Toggles the display of the tank status icon if appropriate for a Graphical Tank Group

Edit ¦ Display Water Level
Toggles the display of the water level in the tank bar graph for a Graphical Tank Group

Edit ¦ Display Point Description
Allows the user to display the Tank Point description for a Graphical Tank Group

Edit ¦ Toggle View (F9)
Toggles between the Graphical and Tabular Tank Group views

From Tank Group Menu
Tank Detail
Opens the selected Tank Detail window

Process Data
Displays the Process Data for the selected tank

Set
Allows the user to view or change the currently selected variable

Column Total
Calculates a total value for the selected column and displays this in the Total row

Sort Ascending
Arranges columns in a Tabular Tank Group into ascending order

Sort Descending
Arranges columns in a Tabular Tank Group into descending order

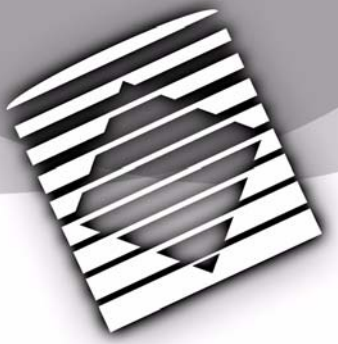
Set Total Position
Positions the Total row above the selected column

Set Total At Bottom
Positions the Total row at the bottom of the Tank Group

Freeze Total Row
Freezes the Total row in its current position

SubTotal Position
Changes the currently selected row (selected row must be cleared first) to a subtotal row

Set Database Levels
Allows the user to select how much of the database tag-name to be displayed in the left most column in a Tabular Tank Group



Custom Graphics

(Professional Edition Only)

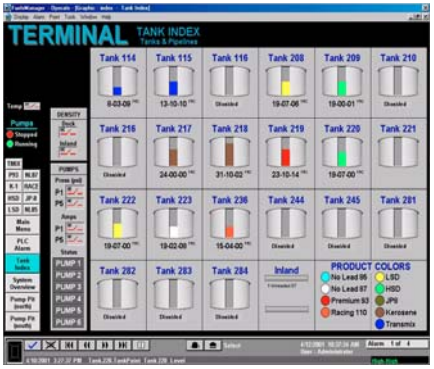
Understanding Custom Graphics

Graphic windows may be custom designed and, therefore, each capability is specific to each facility. For example, a custom graphic window may have built in buttons, animations or hotlinks that allow the operator to:

- View facility specific graphics, such as a tank farm overview
- Maneuver between windows
- Open multiple graphics
- Set values
- Open reports
- Open custom help files

Note! The availability of menu items will change according to the type of window displayed. The Display, Alarm, Point and Tools, as described in the proceeding sections, remain constant for each window type.

Typical custom graphics include Site Overviews and Process Diagrams. Site Overviews are custom graphics that may display a facilities tanks. Clicking on a tank from the site overview custom graphic will cause the Tank Detail window to open. Process Diagrams are custom graphics that show piping and instrumentation status, with hotlinks allowing the user to change the status directly from the custom graphic. For example, when the mouse is moved over an item, such as a valve, a hand will appear, indicating the user may ‘click’ and link to a dialog box or custom graphic. In this example, the user may then be allowed to open or close the valve using a command from the dialog box.



Left - Site Overview Custom Graphic

Right - Process Diagram Custom Graphic

Opening a Graphic Window

The operator first needs to open the Graphic Display Selection dialog box. From there, they may select a particular graphic to open.

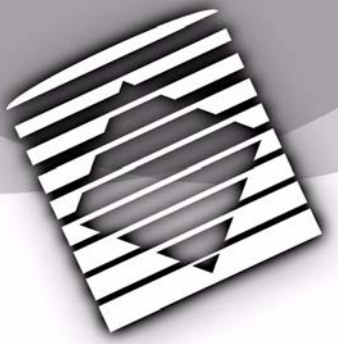
Step-by-Step: Keyboard Shortcut

- Press ‘F2’ key on the keyboard. The Graphic Display Selection dialog box appears.
- From the list, select the particular graphic display. The selection is highlighted.
- Click OK. The graphic window opens.

Note! When FuelsManager OPERATE starts one graphic is displayed. This is a custom graphic and is referred to as the Index Graphic specific to each facility.

Command Summary

Display ¦ Open ¦ Graphic (F2)
Allows the user to select a graphic to open



Working with Reports

Predefined Reports

Operators may work with a number of predefined reports that are supplied with FuelsManager OPERATE or create custom reports specific to each facility. The reports discussed in this section are reports that were created in FuelsManager REPORT. To display a report, operators must first open the Report Manager dialog box, which enables operators to:

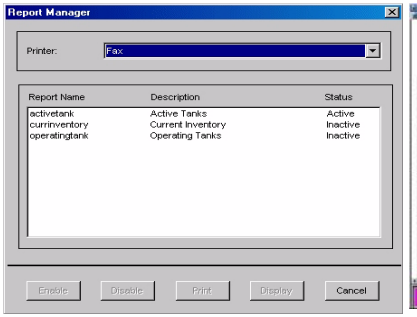
- Print a report on demand
- Select a printer
- Display a report
- Enable and disable reports

Note! When a report is displayed on screen the menu bar contains two additional menus, Print and Page.

To open the Report Manager dialog box, perform the following steps:

Step-by-Step: Keyboard Shortcut

- Press ‘F3’ key on the keyboard.
- Select the desired report in the Report Manager dialog box. The report will now be highlighted.
- Choose Display. The selected report is displayed.



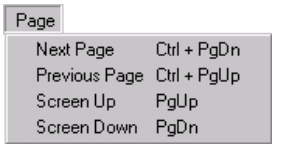
Left - Report Manager dialog box

Right - Report window

When displaying reports on screen, FuelsManager OPERATE allows operators to work with multiple reports, with each report displayed in a separate window.

Viewing Multiple Page Reports

Multiple page reports can be viewed using the commands from the Page menu, keyboard shortcuts or the window scroll bars. The Page menu is shown here with the commands and associated keyboard shortcuts.



Enabling and Disabling a Report

The operator is able to disable or enable a selected report from the Report Manager dialog box.

Step-by-Step

- Select the desired report in the Report Manager dialog box. The report will now be highlighted.

Either...

- Click Enable. The selected report becomes active.

Or....

- Click Disable. The selected report becomes inactive.

An operator may want to disable a report for several reasons:

- Printing problems
- Printer maintenance
- Operator shifts

Printing a Report

The operator can print an undisplayed report from the Report Manager dialog box or print a displayed report from the Report window:

Print an Undisplayed Report

Open the Report Manager dialog box using the previous instructions and then:

Step-by-Step

- Select the desired report in the Report Manager dialog box.
- Confirm that the correct printer is selected.
- Click Print.

Print a Currently Displayed Report

Make sure the report window is the currently selected window and then:

Step-by-Step

- Click the Print menu. The Print dialog box appears
- Select the print options.
- From this dialog box, users are able to select the desired printer, define the print range and the number of copies. Operators also have the option of printing to a disk file.
- Click OK.

Print to File

Selecting the ‘Print to File’ option allows the operator to store the report as a disk file in the project directory as opposed to printing a hard-copy report.

Step-by-Step

- From the Print dialog box, select ‘Print to File’.
- Select OK. The Print to File dialog box appears.
- Enter a file name using a *.prn file extension (e.g. TankFarmWest.prn).

Notes on Printing Reports

- Active reports are printed at preset intervals and print times defined when the report was created.
- Enabling a report causes the report to print at its next specified print time or interval.
- Inactive reports do not print at specified times.
- Contact an Administrator or Supervisor for a list of scheduled report print times and intervals.
- Printing the report does not affect its pre-defined print time or interval. For example, suppose the Current Tank Inventory Report is set to print every hour (03:00, 04:00, etc.). Printing the report at 03:50 does not affect its scheduled time of 04:00.
- Print Files, which may be viewed using any text file application, should be stored in the project directory. The designated subdirectories where the files are stored depend on the facility. Consult an Administrator or Supervisor before continuing.

For example, suppose there are three shifts: morning, swing and night. The Current Tank Volumes report (which is set to print every 2 hours) is not printed during the night shift. So, the swing shift operator disables the report before he or she leaves. At the end of the night shift, the night shift operator enables the report, so that it is printed at the next interval.

Other Types of Reports

Other reports that can be output from FuelsManager OPERATE include:

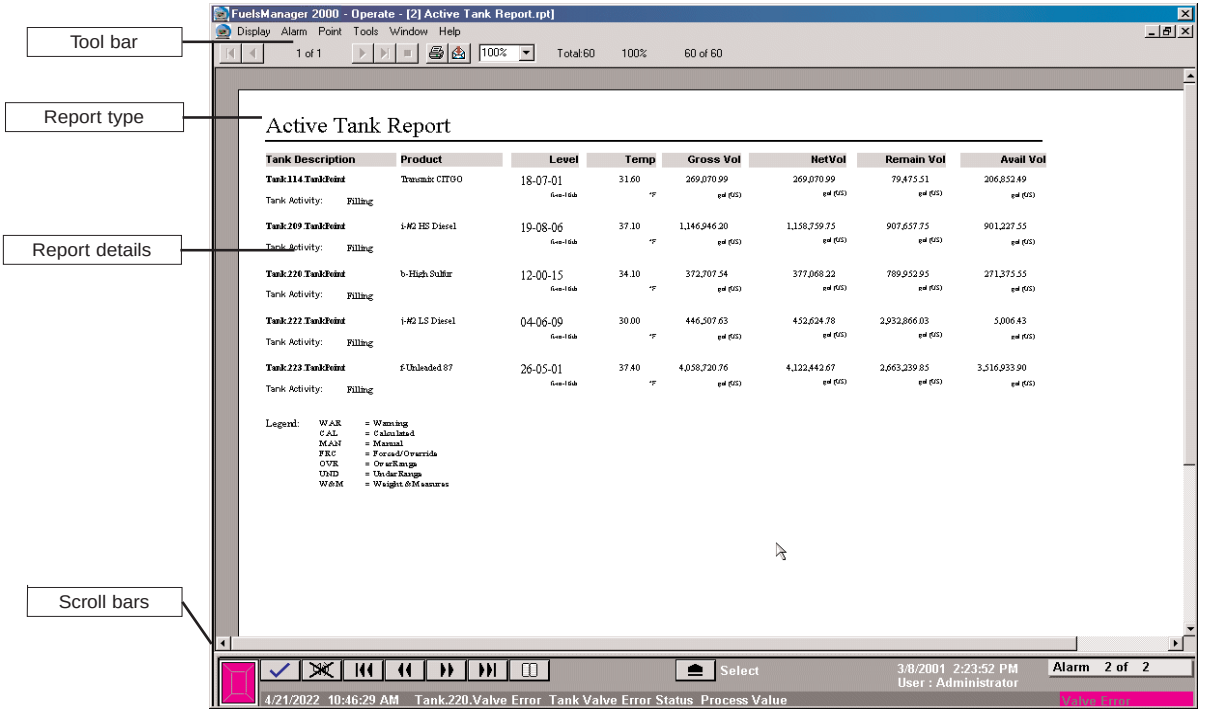
- Historical Reports
- Automatic Alarm/Event Reports
- Log File Browser Reports

Note! Please refer to the section 'Working with Alarms' for details on Automatic Alarm/Event and Log File Browser reports.

Historical Reports

For complete instructions on configuring historical reports, refer to the FuelsManager Administrator Manual. There may be a number of historical reports predefined in the system that operators may be able to open, these could include:

- Current Tank Inventory
- Active Tank
- Inactive Tank
- Last Full Day Tank Change
- 7-Day Tank Change
- Last Full Week Tank Change
- Last Full Month Tank Change
- Month to Date Tank Change



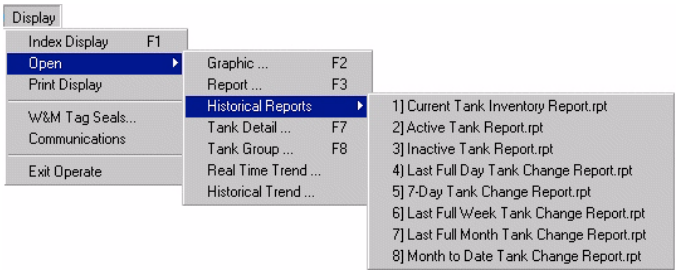
Opening a Historical Report

To open a predefined historical report perform the following steps:

Step-by-Step

- Click Display menu from the menu bar.
- Select Open.
- Select Historical Reports. The historical reports submenu appears with a list of pre-defined reports.
- Select the report required from the submenu. The historical report window opens showing the required data.

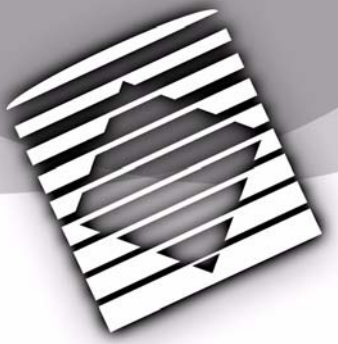
Note! The operator can navigate through historical reports on screen using the scroll bars or tool bar at the top of the window. They may also print the report using the icon on the tool bar.



Historical Reports menu

Command Summary

Display ¦ Open ¦ Report (F3) Allows the user to select a Real-Time report to open
Display ¦ Open ¦ Historical Reports Displays a list of submenu commands that allow the user to open various types of reports, which will be listed as submenus
Print Menu Only available when a report window is active - Allows the user to print the current report
Page ¦ Next Page (Ctrl + PgUp) Displays the next page of the currently displayed report
Page ¦ Previous Page (Ctrl + PgDn) Displays the previous page of the currently displayed report
Page ¦ Screen Down (PgDn) Scrolls down the current page of the currently displayed report
Page ¦ Screen Up (PgUp) Scrolls up the current page of the currently displayed report.



Working with Trends

Understanding Tank Trends

The Trend feature allows operators to view Real-Time and Historical Trends. The defined trend displays data in a time-versus-magnitude format that simulates the operation of a conventional strip chart recorder. A horizontal time-line is provided for movement across the trend. The values, corresponding to the position of the time-line, are displayed in decimal form. An optional grid may be displayed within each window with horizontal and vertical line spacing that can be modified at any time.

Tank Trends are only accessible from the Tank Detail window using the Trend menu. Tank Trends allow the user to view one or more database point variables for that particular tank. For example, a Tank Trend can track the tank level, temperature and gross volume of a single tank.

Generic Trends

Generic Trends provide access to one or more database point variables for one or more database points. This can be any point or variable from the configured database. For example, a Generic Trend can show tank level from three different tanks simultaneously.

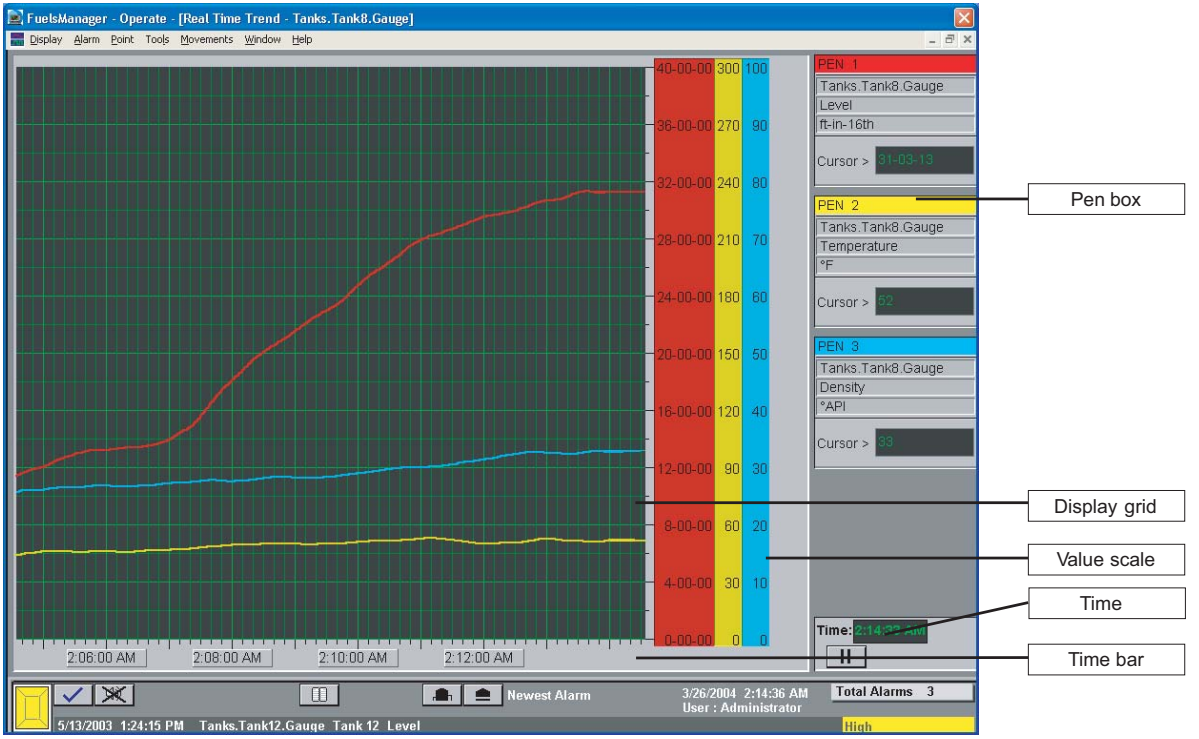
Real-Time and Historical Trends

Note! The user can view both Tank and Generic Trends in real-time or from a historical database.

Real-Time Trends provide the user with current information from the moment the trend window is opened. Historical Trends use recorded data. The operator provides a start and end time for the trend to be produced. Both types of Trends have a preset configuration for a given database point. For Historical Trends to be produced, FuelsManager OPERATE must have access to historical data for the time specified.

Trend Window

Area	Description
Pen Box	The pen box allows users to view the cursor information at the slide bar position within the display grid. Operators can change the pen attributes temporarily by clicking in the pen box.
Time & Date	The time and date area displays the time and date at the slide bar. In a Real-Time trend, the Pause button freezes the display grid allowing users to view a particular time and date.
Value Scale	Value scale defines the vertical axis in value increments. The values are drawn from the historical database and are displayed in decimal form. Operators can set the Major and Minor Divisions for the vertical axis.
Time Bar	Time bar defines the placement of the time axis along the top and/or bottom of the grid by selecting the desired option(s).
Display Grid	The display grid gives users a graphical representation of what the tank has done. The values are displayed in decimal form.
Slider Bar	The slide bar allows users to display information at a particular time within the display grid, the values are shown in the pen boxes.



Opening a Predefined Trend from a Tank Detail

The most common trend operation for the operator is to open a Real-Time Tank trend from a Tank Detail window. With the required Tank Detail window open, follow these steps:

Step-by-Step

- From the Menu bar select the Trend menu.
- Open the Real-Time submenu.
- Select Open. The Tank Trend window opens.

Note! One section of the Real-Time Trend Definition dialog box differs for Real-Time and Historical trends. For Historical trends, the operator provides a start and end time for the trend to be produced in the Time Span section.

Configuring a Tank Trend for an Existing Tank

Operators can customize or create their own Trends. This example shows how to modify the existing, pre-defined configuration for a Tank trend. With the required Tank Detail window open, follow these steps:

Step-by-Step

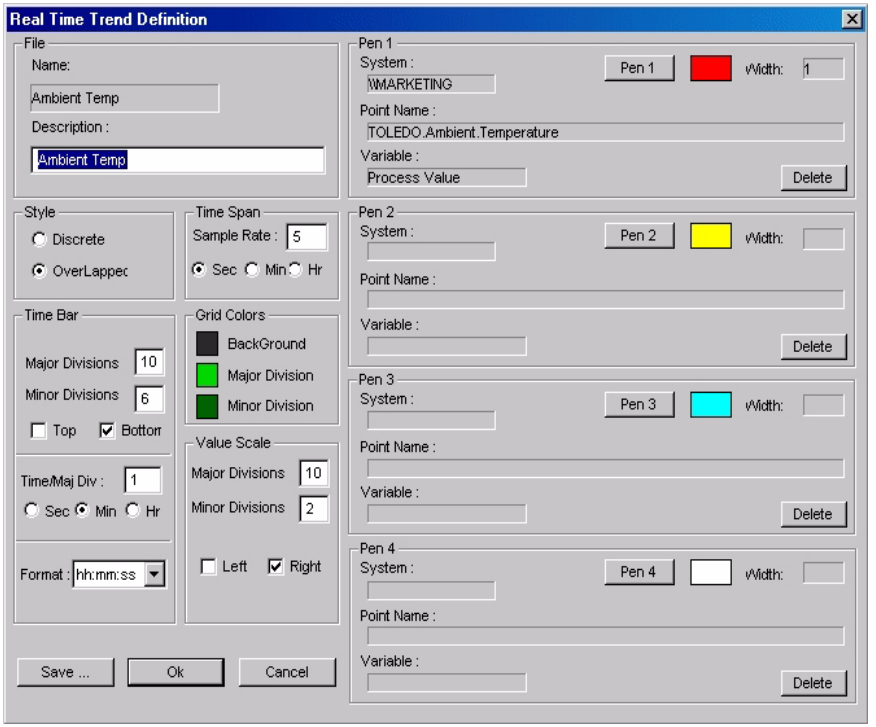
- From the Menu bar select the Trend menu.
- Extend the Real-Time submenu and select the Configure command. The Real-Time Trend Definition dialog box opens.

Defining Real-Time Trends

The following fields in the Real-Time Trend Definition dialog box need to be filled, selected or chosen. Some fields are pre-defined, but can be changed

Step-by-Step

- From the Menu bar select the Trend menu.
- Extend the Real-Time submenu and select the Configure command. The Real-Time Trend Definition dialog box opens.
- Type in a description of the trend.
- Choose a style.
- Define a time span.
- Define a time bar.
- Select the grid colors.
- Define a value scale.
- Select the open attributes using the steps below described in the ‘Selecting Pen Attributes’ section.



Real-Time Trend Definition dialog box

Note! The trend filename, can have up to 35 characters and can be different from the trend Description, which can have up to 30 characters. The files contain the.rat file extension.

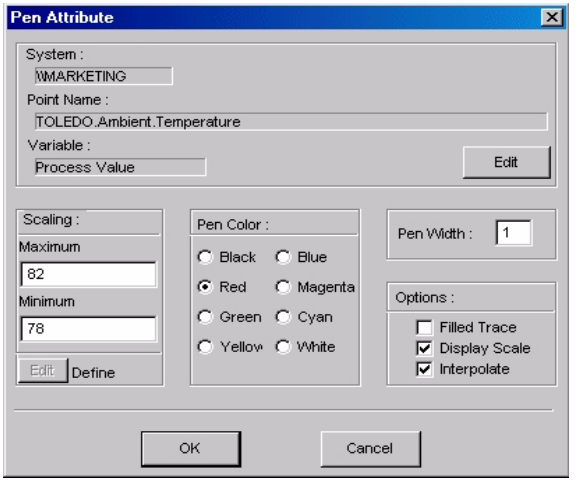
Field/Section	Description
Description	Used to record a more detailed explanation of the trend. The description appears in the Trends menu bar
Style (Discrete/ Overlapped)	The Discrete Style option allows each pen to have a separate window. The Overlapped Style option allows all pens to be plotted in a single window.
Time Span	Defines the time interval in which the system retrieves new data. Operators can set the time interval of how often new data is added to the trend in the Sample Rate field and the interval units in seconds, minutes or hours
Time Bar	The Time Bar defines the horizontal axis in time increments. Operators can set the Major and Minor Divisions for the horizontal axis. • A Major Division is the number of Divisions that can fit in the width of the Real-Time Trend window. • Minor Divisions are the # of cells in one Major Division. The lines defining Major Divisions are thicker than the lines defining Minor Divisions. • Operators can display the time along the top and/or bottom of the grid by selecting the desired option(s). • Time/Maj Div. defines the length in time it takes to complete one Major Division of the time bar. The number entered in this field can be defined in seconds, minutes, or hours. For example, entering 10 seconds for the Time/Maj Div entry causes 10 seconds to complete one Major Division. • The Format defines the type of time format that the system displays along the horizontal axis.
Grid Colors	Grid colors define the three system colors for the grid Divisions and background.
Value Scale	Value Scale defines the vertical axis in value increments. The values correspond to the real-time database and are displayed in decimal form. Operators can set the Major and Minor Divisions for the vertical axis. • A Major Division is the number of Divisions that can fit in the height of the Real-Time trend window. • Minor Divisions are the # of cells in one Major Division. The lines defining Major Divisions are thicker than the lines defining Minor Divisions. • Operators can display the value on the right and/or left of the grid by selecting the desired option(s).

Selecting Pen Attributes

The right side of the Real-Time Trend Definition dialog box displays the settings for pens (Up to four pens may be created). Each variable may have a unique pen color assigned for plotting. Scales are drawn at the right vertical axis depending on the number of pens selected. Both the scale and the range are color-coded to match the pen selected

Step-by-Step

- After defining a trend as described in the ‘Defining Real-Time Trends’.
- Click on the Pen 1 button. The Pen Attribute dialog box appears.
- Choose Scaling parameters. Scaling
- Choose Pen Color.
- Choose Pen Width.
- Select Other Options.
- Click OK. The changes are temporarily made to the Tank Trend displayed.



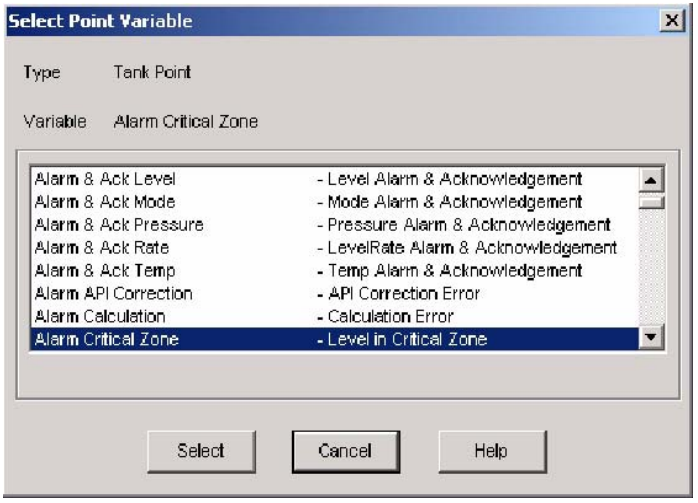
Pen Attributes dialog box

Field/Section	Description
Scaling	Defines the minimum and maximum range of the variable selected. The initial values in this area are derived from the limits defined during database configuration.
Pen Color	Defines the color of the pen used when plotting the results on the screen.
Pen Width	Pen Width defines the thickness of the line being plotted on the screen.

Field/Section	Description
Options	Other Options include selecting the trace style of the trend. The Filled Trace produces a solid trace. The Display Scale is shown on the vertical axis.

Changing the Point Variable for a Tank Trend Pen

Each pen within a Tank trend corresponds to a database point variable for that particular tank. Pens may be modified to display different variables in the current trend, to do this follow the steps below.



Select Point Variable dialog box

Step-by-Step

- From the Pen Attributes dialog box click Edit.
- The Select Point Variable dialog box appears. This dialog box displays the choices appropriate for this value: the type and variable.
- Scroll through the list and choose a variable, then click OK. The Pen Attribute dialog box appears.
- Confirm that the correct point and variable are displayed in the dialog box and click OK.
- Repeat the procedure for additional pens from the Real-Time Trend Definition dialog box.

Defining Pen Attributes from a Trend Window

The operator is able to define Pen Attributes from the Trend window and during the editing or creating a trend process.

Step-by-Step

- From the Trend window click on the colored Pen Title bar. The Pen Attribute dialog box appears.
- Make the selections for Pen Attributes based on options 2-5 described in the ‘Selecting Pen Attributes’ section.
- Click OK. The changes are temporarily made to the trend displayed.

Editing a Trend

To edit a Trend, perform the following steps:

Step-by-Step

- From the Menu bar, select Display.
- Select the Open submenu.
- Select Real-Time trend.
- The Select Trend Definition dialog box opens.
- Highlight the desired filename.
- Click Edit. The Real-Time Trend Definition dialog box appears.
- Choose the required selections.
- Many of the selections are similar to creating a new trend. Please reference the section above.
- When all changes are made, re-save the Trend file. Operators are also able to save this as a new file.

Creating a New Generic Tank Trend

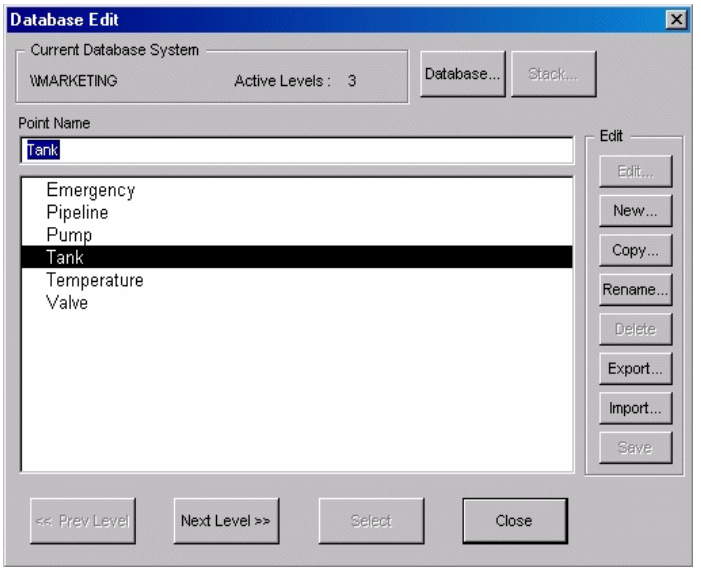
FuelsManager OPERATE provides operators with the ability to customize and create their own trends. In this example users can create a new Generic, Real-Time Trend.

Step-by-Step

- From the Menu bar select the Display menu.
- Select the Open submenu.
- Select Real-Time trend.
- The Select Trend Definition dialog box opens.
- Select New.
- The Real-Time Trend Definition dialog box appears
- Modify, change and select all the entries as previously described for a Tank trend until it is fully configured.
- All changes are permanently made to this trend when it is saved.

Defining the Database, Point and Variable

The operator is able to define the database, point and variable for a specific pen during when creating or editing a trend. Continuing from the Step-by-Step instruction above, with the Select Trend Definition dialog box open:

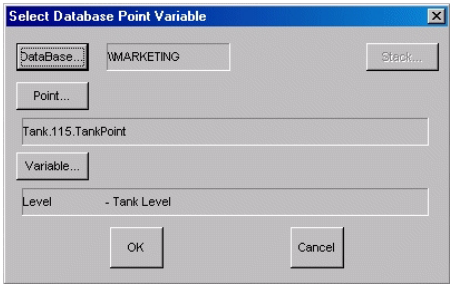


Database Edit dialog box

Step-by-Step

- Click on the Pen 1 button.
- The Database Edit dialog box appears. From this dialog box, the user is able to define the database, point and variable for this specific pen.
- Click on the Database button to select the DataManager.
- A Select DataManager Subsystem dialog box appears.
- Click on the desired DataManager.
- The system highlights and places the selection in the System field.
- Click Select.
- The Database Edit dialog box appears with the selection.
- Choose the desired point name and click Select.

Continued...



Select Database Point Variable dialog box

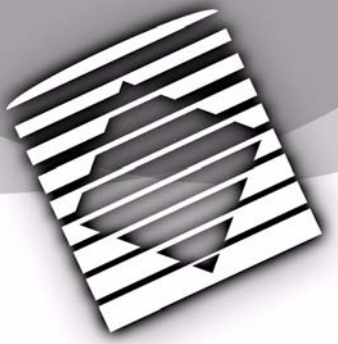
...Continued

- The Select Database Point Variable dialog box appears showing the selection. To change the selection, click on either the Database, Point or Variable buttons again.
- If these selections are correct click Select.
- The Pen Attributes dialog box appears.
- Modify the Pen attributes as detailed in the sections above, then Click OK.
- The Real-Time Trend Definition dialog box appears.
- Modify, change and select all the entries as previously described for a Tank trend until it is fully configured.
- All changes are permanently made to this trend when it is saved.

Note! In the Database Edit dialog box users are able to browse through these levels by using the <<Prev Level and Next Level>> buttons. The Select button is not enabled until the last level is selected.

Command Summary

Display ¦ Open ¦ Real-Time Trend Allows the user to select a Real-Time (Generic) trend to open
Display ¦ Open ¦ Historical Trend Allows the user to select a Historical (Generic) trend to open
Trend Menu Only Available when a Tank Detail is open
Trend ¦ Real-Time Displays a list of submenu commands
Trend ¦ Real-Time ¦ Open Opens the currently configured Real-Time trend for the selected tank
Trend ¦ Real-Time ¦ Configure Allows the user to configure the values for the Real-Time trend
Trend ¦ Historical Displays a list of submenu commands
Trend ¦ Historical ¦ Open Opens the currently configured Historical trend for the selected tank
Trend ¦ Historical ¦ Configure Allows the user to configure the values for the Historical trend



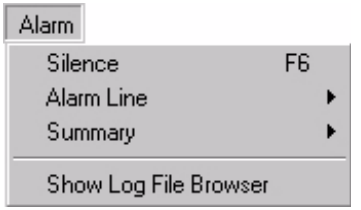
Working with Alarms

Alarm Tools

FuelsManager OPERATE provides the operator with two methods of working with alarm configuration, display and management: the Alarm menu and the Alarm tool bar.

Alarm Menu

This menu enables users to silence, acknowledge, and browse through alarms. Operators are also able to access the Alarm Summary. The menu options include:



Alarm menu

Silence
The Silence command allows users to silence the alarm(s).

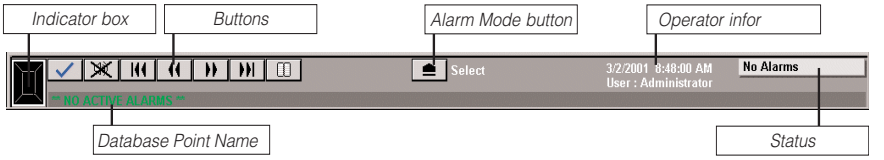
Alarm Line
The Alarm Line submenu includes the same capabilities found on the Alarm tool bar. Selecting any of these options produces the same result as pressing the corresponding icon button on the Alarm tool bar.

Summary
The Summary submenu is used to open, restore, and close the Alarm Summary window. The Alarm Summary lists the current alarms with the most recent alarm displayed at the top of the list. Once opened, users are able to change the length of the Alarm Summary by clicking and dragging the bottom edge to a desired position.

Log File Browser
Opens the Log File Browser, where the operator can view and print reports for alarms and events.

Alarm Tool Bar

The Alarm tool bar is located at the bottom of FuelsManager OPERATE window. It allows users to acknowledge and view alarm information such as the number of alarms, the alarm description and alarm priority.



Alarm tool bar

Operator Information
Identifies the operator currently logged onto the system, along with the time and date.

Alarm Indicator Box

The Alarm Indicator box displays the color of the highest priority active alarm in the system.

Color	Description
Black	NO alarms are present.
Flashing color	System contains unacknowledged, active alarm(s). Color reflects alarm(s) of highest priority.
Flashing green	One or more alarms have returned to normal, but have NOT been acknowledged.
Non-flashing color	One or more alarms have NOT returned to normal, but have been acknowledged. Color reflects alarm(s) of highest priority.

Alarm Mode Button

Using the Alarm Mode button, operators can cycle through various alarm modes to respond to alarms. See the Current Alarm Status Table for details of each mode. Cycling through the different mode will change the operator information and the buttons displayed on the Alarm tool bar.

Mode	Description
Select	Used to view all alarm mode types.
Newest UnAck	Used to view newest unacknowledged alarm
Oldest UnAck	Used to view oldest unacknowledged alarm
Newest Alarm	Used to view newest alarm
Oldest Alarm	Used to view oldest alarm

Current Alarm Status

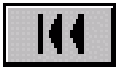
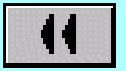
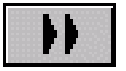
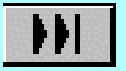
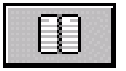
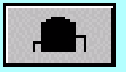
The current alarm status depends on the database value. For example, if a tank level alarm becomes active, this line would display a status, such as Low or High-High.

Alarms appear in the order in which they occur. This number shown in the status area represents where the currently selected alarm stands in the total number of alarms (for example, 1 of 4).

Color	Description
Flashing color	Unacknowledged active alarm
Flashing green	Alarm has returned to normal, but has not been acknowledged
Non-flashing color	Alarm has NOT returned to normal, but has been acknowledged

Alarm Buttons

Operators can browse through any current alarms using the buttons on the Tool bar. An additional three buttons are available, depending on the type of an alarm. Some alarms have an associated graphic file, help file or both.

Alarm Button	Name	Description
	Acknowledge	Used to acknowledge an alarm
	Silence	Used to silence an audible alarm
	First	Used to view the first alarm in the current FuelsManager OPERATE session
	Previous	Used to view the alarm before the alarm currently displayed
	Next	Used to view the next alarm after the alarm currently displayed
	Last	Used to view the last alarm in the current FuelsManager OPERATE session
	Summary	Used to view the Alarm Summary
	Help graphic	Visible if there is a graphic assigned to the currently displayed alarm, - It is used to activate the run-time graphic associated with that alarm.
	Help file	Visible if there is a help file associated with the currently displayed alarm
	Tank Detail	Visible only if the alarm pertains to a tank. It is used to activate the Tank Detail associated with the alarm.

Alarm Line

The Alarm Line describes an alarm in the system. If no alarms are present, the Alarm Line displays:

NO ACTIVE ALARMS

When an alarm is present, the line displays the information shown in the table opposite.

Element	Description	Format
Time	The time of day the alarm occurred - expressed in the format:	HH:MM:SS (Hour, Minute, Second).
Date	The date the alarm occurred - expressed in the format:	MM/DD/YY (Month, Day, Year).
Database Point	The name as it appears in the database (Tank_34 Gauge) and the corresponding variable (Level)	
Alarm Status	The database points alarm condition, examples include: Disconnected, High-High and Movement Alarm.	

When an Alarm Sounds

When one or more alarms become active, the following events may occur:

- Audible tone occurs corresponding to the alarm priority. The higher the pitch, the higher the priority.
- Alarm Indicator box (found at the bottom of the window) flashes the assigned alarm color (for example red, yellow).
- Buttons and/or other objects flash the assigned alarm color. Some of the facility-specific graphics may contain text or objects that flash when the corresponding alarms become active.

  For example, the level field for a particular tank will flash in the Tank Detail and Tank Group window if there is a level alarm and the status field in the Alarm Summary will flash.

- The alarms and events are logged to a disk file.

Responding to an Alarm

Generally, an operator's response will be to:

- View the alarm details.
- Acknowledge and silence the alarm.
- Perform operations to remove the alarm condition in the field.

The Alarm tool bar (described in the previous section) provides some basic details of current Alarm status. FuelsManager OPERATE also allows these details to be viewed by the operator using the Alarm Summary.

Viewing Alarm Details Using the Alarm Summary

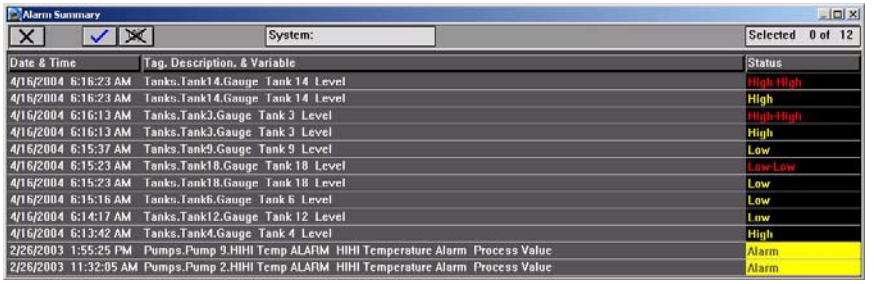
The operator can use the Alarm Summary to view all the current acknowledged and unacknowledged alarms. To access the alarm summary, perform the following step:

Step-by-Step

- On the Alarm tool bar select the Alarm Summary icon.
- The Alarm Summary appears over the current window.

The Alarm Summary lists a maximum of 28 alarms per page with the most recent alarm at the top of the list. The following information is provided for each individual alarm:

- Time & Date (e.g. 11:14:51 02/21/96)
- Tag, Description & Variable (e.g. Site_34.Tank121.GAUGE, Site 34 Tank 121, Temperature)
- Alarm status (e.g. Low-Low)


Alarm Summary
System:
Selected 0 of 12
Date & Time
Tag, Description, & Variable
Status
4/16/2004 6:16:23 AM Tanks.Tank14.Gauge Tank 14 Level High High
4/16/2004 6:16:23 AM Tanks.Tank14.Gauge Tank 14 Level High
4/16/2004 6:16:13 AM Tanks.Tank3.Gauge Tank 3 Level High High
4/16/2004 6:16:13 AM Tanks.Tank3.Gauge Tank 3 Level High
4/16/2004 6:15:37 AM Tanks.Tank9.Gauge Tank 9 Level Low
4/16/2004 6:15:23 AM Tanks.Tank18.Gauge Tank 18 Level Low-Low
4/16/2004 6:15:23 AM Tanks.Tank18.Gauge Tank 18 Level Low
4/16/2004 6:15:16 AM Tanks.Tank6.Gauge Tank 6 Level Low
4/16/2004 6:14:17 AM Tanks.Tank12.Gauge Tank 12 Level Low
4/16/2004 6:13:42 AM Tanks.Tank4.Gauge Tank 4 Level High
2/26/2003 1:55:25 PM Pumps.Pump 9.HIHI Temp ALARM HIHI Temperature Alarm Process Value Alarm
2/26/2003 11:32:05 AM Pumps.Pump 2.HIHI Temp ALARM HIHI Temperature Alarm Process Value Alarm

Alarm Summary window

The Tank Detail Window and Alarm Conditions

If the alarm is associated with an individual tank, the operator may want to view more details associated with the tank. The Tank Detail is accessible directly from the Alarm Summary and the Alarm tool bar using the Tank Detail button:

Step-by-Step

- In the Alarm tool bar, click the Alarm Mode button until the newest alarm is displayed.
- The Tank Detail icon appears next to the Alarm Mode icon.
- Click the Alarm Mode icon.
- The Tank Detail screen appears and the data field will be highlighted in the designated color for that alarm condition.

Acknowledging an Alarm

FuelsManager OPERATE will continue to flash facility-specific graphics until the alarm has been acknowledged. Once acknowledged, the facility-specific graphics (text or objects) will remain the designated color for that alarm status until the alarm condition has been fixed. The operator can acknowledge alarms in three ways.

Step-by-Step

- In the Alarm Summary window, click the Alarm Acknowledge button.

Silencing Alarms Before Acknowledgement

Once the alarm status and condition are known, the operator may decide to silence the alarm before acknowledging the alarm. Each of these options will silence the alarm:

Step-by-Step

- On the Menu bar, open the Alarm menu.
- Select the Silence command.

Removing the Alarm Condition

Removing the alarm condition will depend on the cause of the alarm in the field. The operator may be able to use features in FuelsManager OPERATE. For example, product moved between tanks may have caused a level alarm. Please see the FuelsManager Administrator Manual in relation to that alarm condition.

Alarm Details in the Log File Browser

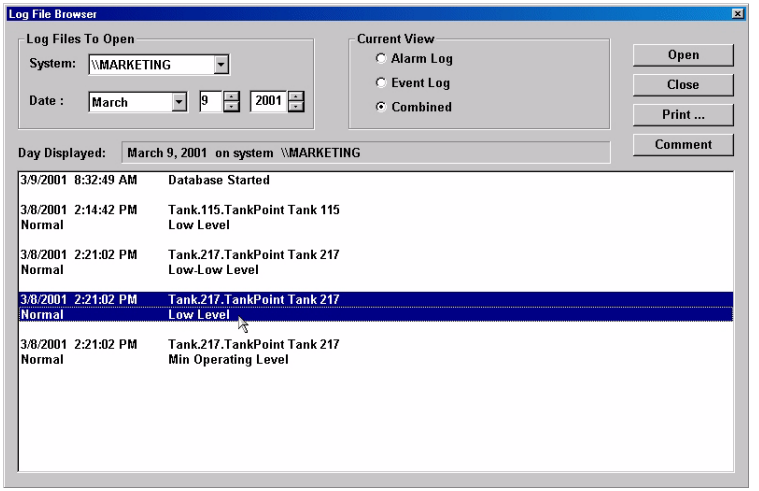
The operator can use the Log File Browser to view and print all the alarms, events or a combination of both for any selected day.

Opening the Log File Browser

To open the Log File Browser dialog box, perform the following steps:

Step-by-Step

- On the Menu bar open the Alarm menu.
- Select Show Log File Browser command.
- The Log File Browser dialog box appears.



Log File Browser dialog box

Viewing Details in the Log File Browser

The Log File Browser is empty upon first opening the dialog box. To view the information required for a specific time and date perform the following operation:

Step-by-Step

- Select the appropriate database system, date and the log type (Alarm, Event or Combined).
- Click Open.
- The Log File Browser window contains all the alarms and events generated by the system.

Alarm Information

Alarms may contain the following information:

- New alarm state
- Tag and description of database point
- Time and date of occurrence
- Priority of alarm

Event Types

Events may be of the following types:

- New tank setpoints
- Tank status changes
- Tank mode changes
- Operator-entered data

Event Information

Events may contain the following information:

- Present status
- Tag and description of database point
- Time and date of occurrence
- Event type and identification

To display for additional dates, repeat the operations above.

Printing a Log File Browser Entry

To print a Log File Browser entry, perform the following steps:

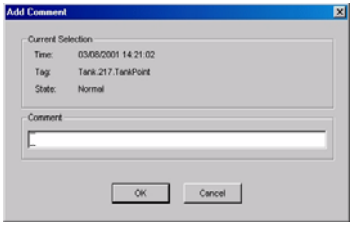
Step-by-Step

- Click Print.
- The Print dialog box appears. From this dialog box, users are able to define the page range, the number of copies and the desired printer.
- Click OK.

The hard copy contains all the information as displayed in the Log File Browser dialog box. The page number and sequence (for example ‘2 of 5’ pages) is found at the bottom-center of each page. Closing the Log File Browser dialog box returns users to the FuelsManager OPERATE screen.

Adding Comments to Log Files

Operators can add comments to a particular alarm, event or both by using the Comment feature, which displays text (60 characters maximum) immediately below the alarm or event. If more than 60 characters are required, the system allows multiple comments to be associated with a single alarm, once entered comments cannot be deleted.



Adding comments in the Log File Browser

Printing Specific Selections of the Log File Browser

Operators can print specific selections by highlighting the desired selections or print the daily log, which can include alarms, events or both.

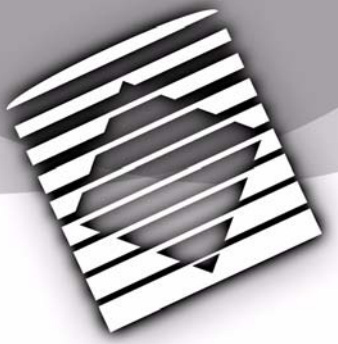
Error Messages in the Log File Browser

Operators can view a day file by selecting the appropriate system, date and viewing selection (alarms, events or both). Click Open to access the data. If this entry does not exist, one of the following messages appear:

Error Message	Description
If Current View is set to Alarm Log:	Then the system displays the following message: The file alarmEvent_(Date).LOG could not be opened.
If Current View is set to Event Log:	Then the system displays the following message: The file alarmEvent_(Date).LOG could not be opened.
If Current View is set to Combined:	Then the system displays the following message: The file alarmEvent_(Date).LOG could not be opened.

Command Summary

Alarm ¦ Silence (F6) Silences the current alarms
Alarm ¦ Alarm Line Displays a list of submenu commands
Alarm ¦ Alarm Line ¦ Acknowledge Acknowledges the current alarm
Alarm ¦ Alarm Line ¦ First Selects the first alarm in the current alarm list
Alarm ¦ Alarm Line ¦ Previous Selects the previously viewed/selected alarm in the current alarm list
Alarm ¦ Alarm Line ¦ Next Selects the next alarm in the current alarm list
Alarm ¦ Alarm Line ¦ Last Selects the last alarm that was triggered
Alarm ¦ Alarm Line ¦ Alarm Graphic Opens a specific graphic screen associated with the currently selected alarm.
Alarm ¦ Summary Displays a list of submenu commands
Alarm ¦ Summary ¦ Open/Restore (F5) Opens/Restores the Alarm Summary window
Alarm ¦ Summary ¦ Close Window Closes the Alarm Summary window
Alarm ¦ Show Log File Browser Opens the Log File Browser window



Working with Product Movement

(Professional Edition Only)

Understanding Product Movement

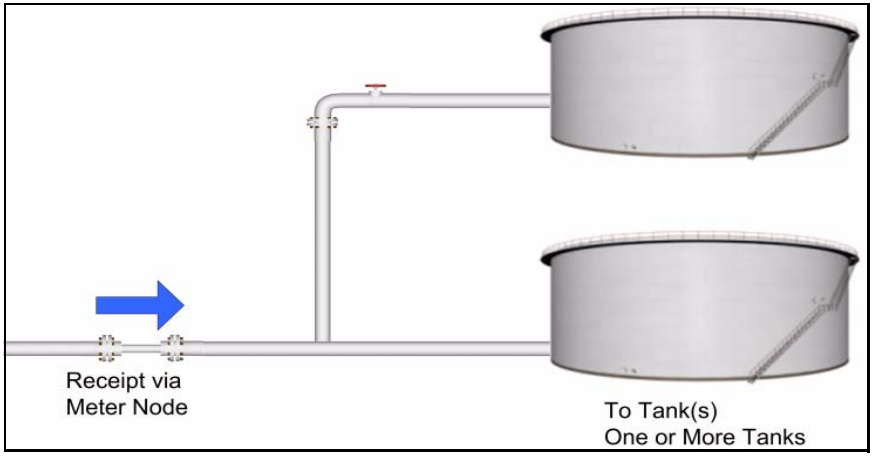
FuelsManager's Product Movement System allows refineries and bulk storage facilities to track movements of product. The Movement System manages product movements and archives information detailing the actual amounts of product transferred. A movement involves transferring product from one or more sources to one or more destinations. The system manages tank-to-tank transfers, charges, yields (rundowns), shipments, receipts, water drains and blends. It provides real-time operational alarms when setpoints are approached and reached.

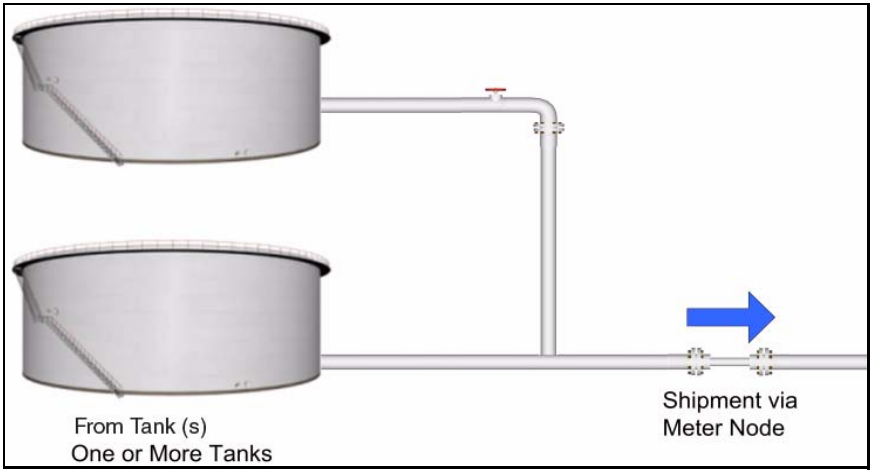
It is assumed that the necessary equipment has already been installed and commissioned. If there are questions concerning the status of any equipment, please contact an Administrator or Supervisor before continuing. Contained in this section are brief explanations followed by step-by-step instructions to the most commonly used processes of the Product Movement System.

Product Movement Terms

This section uses the following terms when explaining how to operate the Product Movement System.

Node Type	Description
Unit	The Product Movement System allows the creation of Source/Destination designations called units, examples could be Pipeline XYZ, Truck Rack 123, Pumphouse A2B. Units allow the operator to use meaningful names for plant items being utilized for product movements. A unit has no measuring device so it has no way of monitoring product movement, users cannot enter movement setpoints for a unit and movements involving units will not calculate discrepancies.
Meter	A location in a product movement instance where a reading from a physical meter is possible. Operators can associate FuelsManager input and output database points with meter nodes and have the meter data automatically collected or manually entered.
Tank	Any tank point configured in the FuelsManager System. A tank point includes predefined variables specifically designed for tank gauging applications. Each tank provides process values, or tank variables, which may be entered manually, received from a field device or internally calculated.





Node Diagrams

Term	Description
Closeout	• Stopping of the movement (either manually OR due to non-zero flow) • If the movement is active at the system specified closeout time (default midnight)
Opening Value	• If a close out has occurred, the opening value is the value of the particular variable at the last closeout time. • If the movement has been started but a closeout has not occurred yet, the opening value is the value of the particular variable when the movement started.
Closeout Value	Only exists after a closeout event has occurred. If the movement remains active, and further closeout events occur the closeout value will be updated.
Start Value	The value of the particular variable when the movement was initiated.
Combined Movement	A combination of movements that involve one or more common tanks. The following combinations are NOT allowed: • A combination that involves the same node pair twice. • A combination that results in a circular transfer of product.
Discrepancy	The difference between the total amount transferred from all the From tanks and the total amount received at all the To tanks.
Totals	Only available for Shipment and Receipt movements and is the sum of amount transferred.

Product Movement States

The following table shows the different states of movements.

Movement States	Description
Inactive	The movement has been setup but has not been initiated by the operator.
Active	The movement has been initiated by the operator and is not configured to use Start on Non-Zero Flow.
Disabled	The movement cannot be initiated because one or more of the tanks involved in the movement are currently in use by another movement and this movement cannot be combined.
Halted	The movement has been paused by the operator.
Failed	During the start-up of the movement a failure occurred, the movement is neither active nor inactive. The operator must use the Reset menu option to clear this state.
Starting	The movement has been initiated by the operator but the movement has been configured to Start on Non-Zero Flow and no flow has been detected yet.
Stopping	The movement has been configured to Stop on Non-Zero Flow and zero flow has not existed for a time greater than the Zero Flow Hold Off Value.

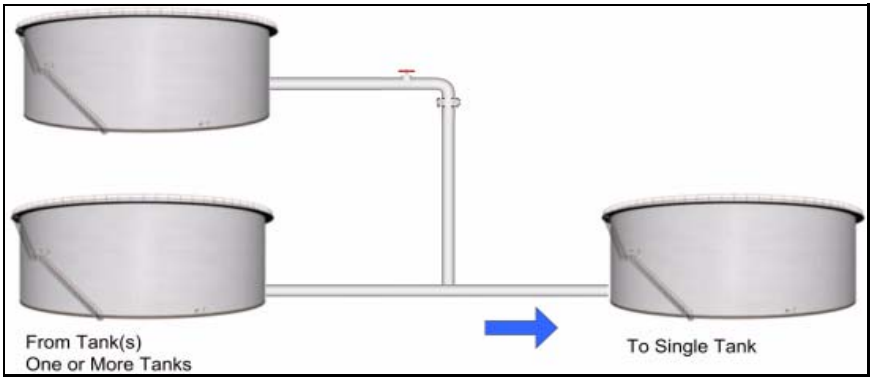
Product Movement Types

The following table shows the different types of movements.

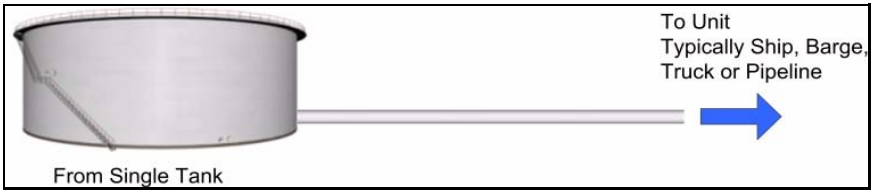
Movement Types	From (Sources)	To (Destinations)
Blend	One or More Tanks	One Tank
Charge	One Tank	One Unit/Meter
Receipt	One Unit/Meter	One or More Tanks
Run-Down	One Unit/Meter	One Tank
Shipment	One or More Tanks	One Unit/Meter
Transfer	One Tank	One Tank
Water Drain	One Tank	One Unit/Meter

To assist in setting up complex movements, combined movements can be produced by chaining together other movements.

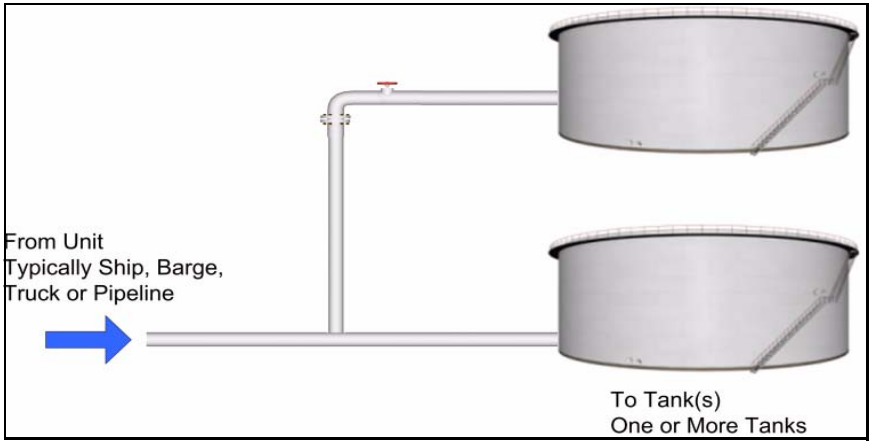
The following are illustrations of the Movement Types:



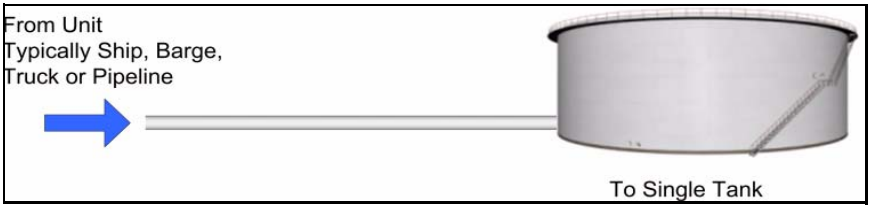
Blend Movement



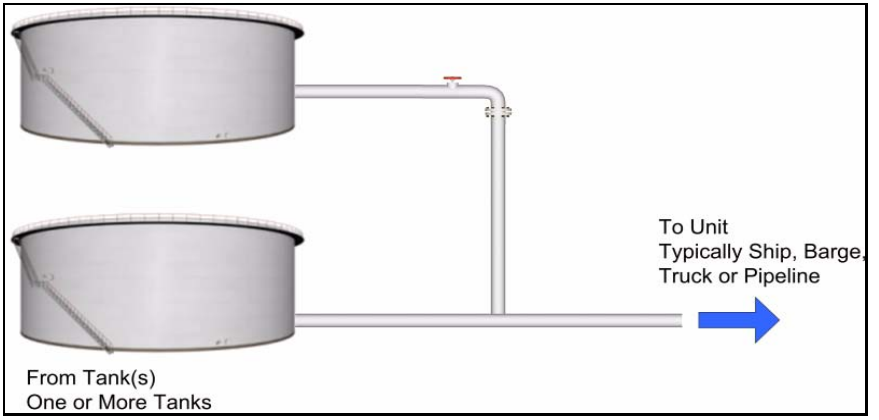
Charge Movement



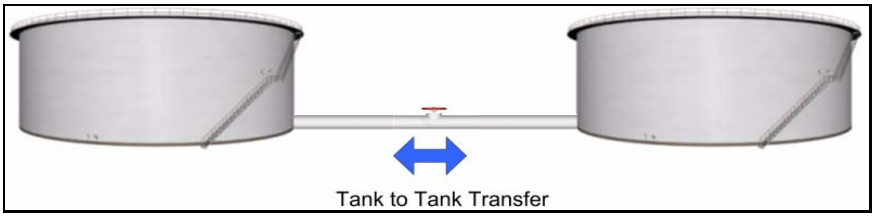
Receipt Movement



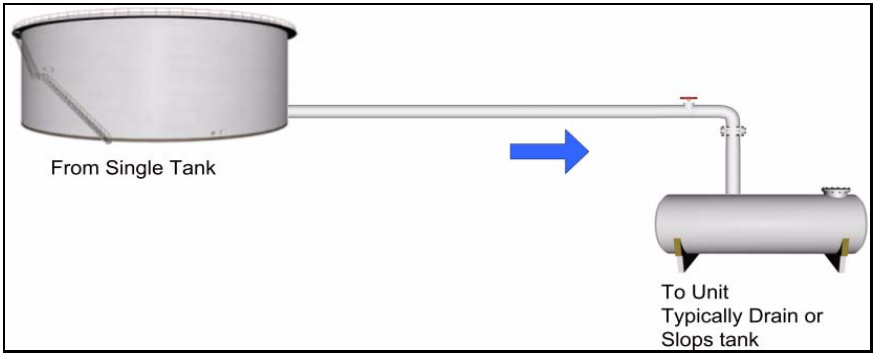
Run-Down Movement



Shipment Movement



Transfer Movement

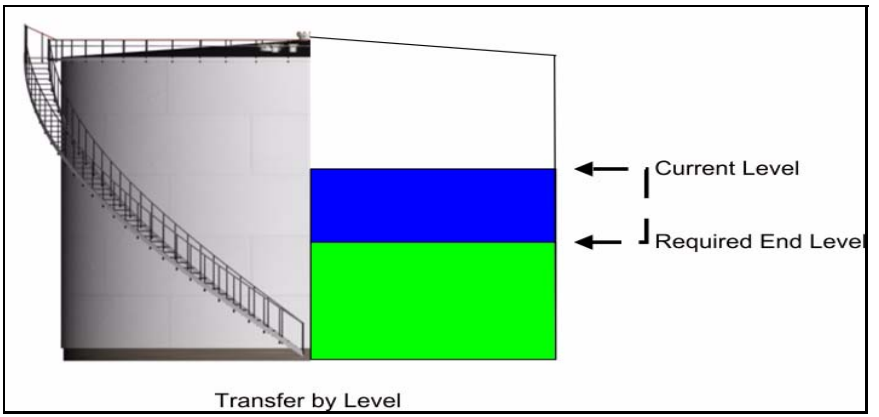


Water-Drain Movement

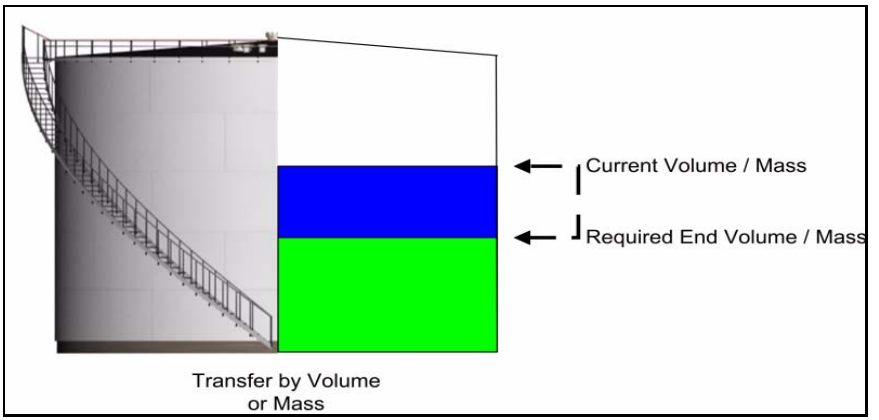
Product Transfer (Xfr) Modes

The transfer (or Xfr) mode refers to the measuring denomination operators are using to measure the product movement: Level, Mass, or Differential Volume or Mass.

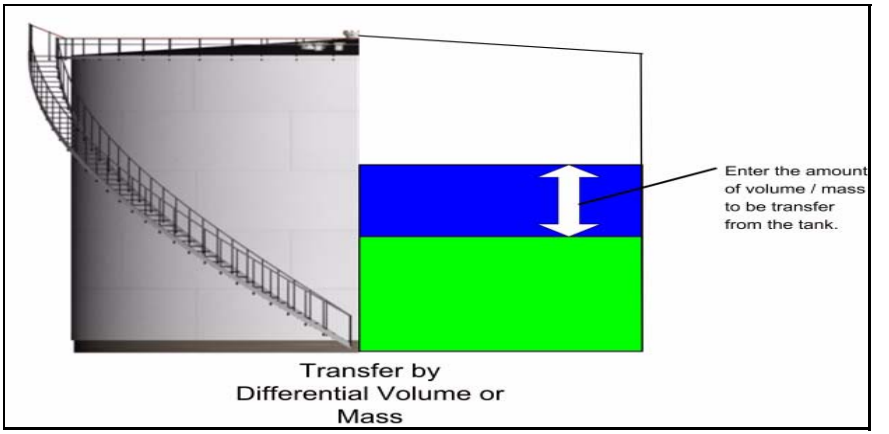
Transfer Mode	Description
Xfr Level	A transfer that is terminated by defined Level
Xfr Volume	A transfer that is terminated by Stop Total Volume
Xfr Diff Vol	A transfer that is terminated by the Stop Differential Volume (change in volume)
Xfr Mass	A transfer that is terminated by the Stop Mass
Xfr Diff Mass	A transfer that is terminated by the Stop Differential Mass (change in mass)



Product Transfer by Level



Product Transfer by Volume or Mass



Product Transfer by Differential Volume or Mass

Using Product Movement

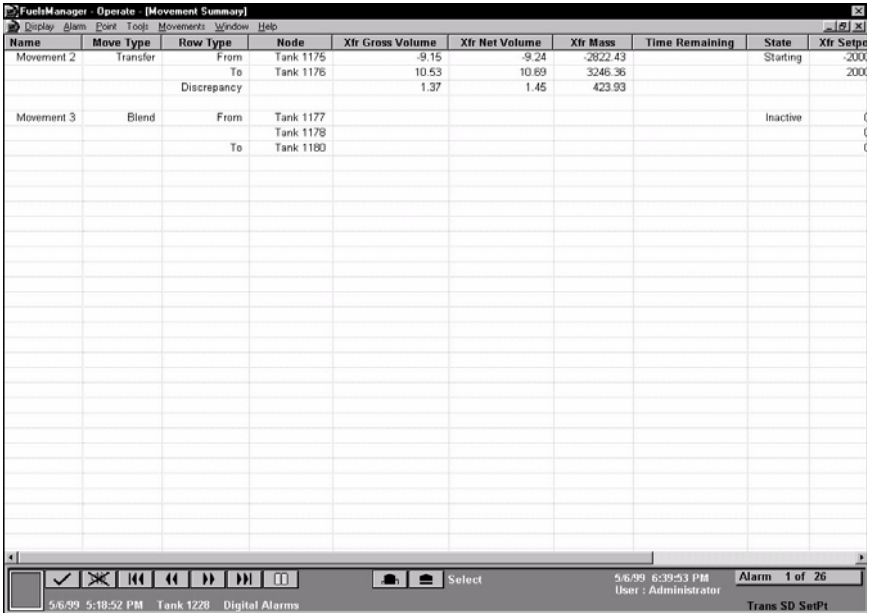
The Product Movement System is divided into two parts, the definition of possible movement paths (creating a movement) and the operation of the actual product movement (operating a movement instance).

This section provides operational information for the day-to-day use of FuelsManager Product Movement.

The FuelsManager OPERATE program allows the user to select, set up, start, monitor and terminate movement instances. The operator uses the Movements menu item to open either the Movement Summary or Movement History tables.

Movement Summary Table

The Movement Summary table displays the real-time movement data. The table continues to display a movement's data until it is either stopped or deleted.


FuelsManager - Operate - [Movement Summary]
Display Alarm Point Tools Movements Window Help
Name Move Type Row Type Node Xfr Gross Volume Xfr Net Volume Xfr Mass Time Remaining State Xfr Setpo
Movement 2 Transfer From Tank 1175 -9.15 -9.24 -2822.43 Starting -200
To Tank 1176 10.53 10.69 3246.36 200
Discrepancy 1.37 1.45 423.93
Movement 3 Blend From Tank 1177 Inactive
Tank 1178
To Tank 1180
Select
5/6/99 6:39:53 PM
User : Administrator
Alarm 1 of 26
5/6/99 5:18:52 PM Tank 1228 Digital Alarms
Trans SD SetPt

Default Table Columns

These columns automatically appear in the Movement Summary table.

Name	Row Type	Node
Move Type	Xfr Gross Volume	Xfr Net Volume
Xfr Mass	Time Remaining	State
Xfr Setpoint	Xfr Mode	Start Time
Product	User	

Additional Table Columns

These columns are available in the Movement Summary table.

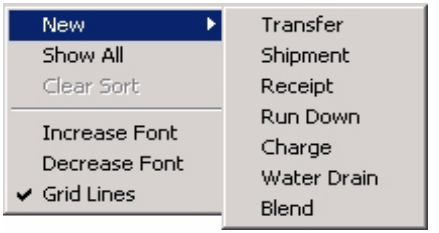
Amb. Temperature	Comment	Density
Density Temp	Density Units	Flow
Flow Units	Gross Volume	Group
Initiation Count	Initiation Time	Level
Level Units	Mass	Mass Units
Move Type	Name	Net Volume
Node	Opening Amb. Temperature	Opening Density
Opening Density Temperature	Opening Mass	Opening Gross Volume
Opening Level	Opening Mass Xfr Mass Units	Opening Roof Volume
Opening Shell Correction	Opening Std Density	Opening Temp
Opening VCF	Opening Volume	Opening Water Level
Opening Water Volume	Order Number	Product
Product Description	Row Type	Roof Volume
Shell Correction	Start Amb. Temperature	Start Amb. Temperature Date/Time
Start Density	Start Density Date/Time	Start Density Temperature
Start Employee ID	Start Gross Volume	Start Handgauge Ambient Temp Time
Start Handgauge Density Temp Time	Start Handgauge Density Time	Start Handgauge Level Time
Start Handgauge Ref Height	Start Handgauge Ref Height Time	Start Handgauge Temp Time
Start Handgauge Water Level Time	Start Level	Start Mass
Start Net Volume	Start Roof Volume	Start Shell Correction
Start Std Density	Start Std. Density Date/ Time	Start Tank Ref. Height
Start Temp	Start Temperature	Start Temperature Date/ Time
Start VCF	Start Volume	Start Water Level

Start Water Level Date/ Time	Start Water Volume	State
Status	Std Density	Temp Units
Temperature	Time Remaining	User Def String (1 - 10)
User Name	Volume Units	VCF
Volume	Water Level	Water Volume
Xfr Deviation	Xfr Gross Volume	Xfr Setpoint Units
Xfr Mass	Xfr Mode	Xfr Net Volume
Xfr Setpoint	Xfr Setpoint Units	Xfr Volume Units
Xfr Water Volume		

Menu Commands

The following sections detail the use of the Movement Summary pop-up menu, the contents of this menu differ slightly depending on where on the screen the mouse cursor is positioned when operators right-click.

This pop-up menu appears if users right-click while the mouse cursor is positioned on an empty row in the Movement Summary grid.

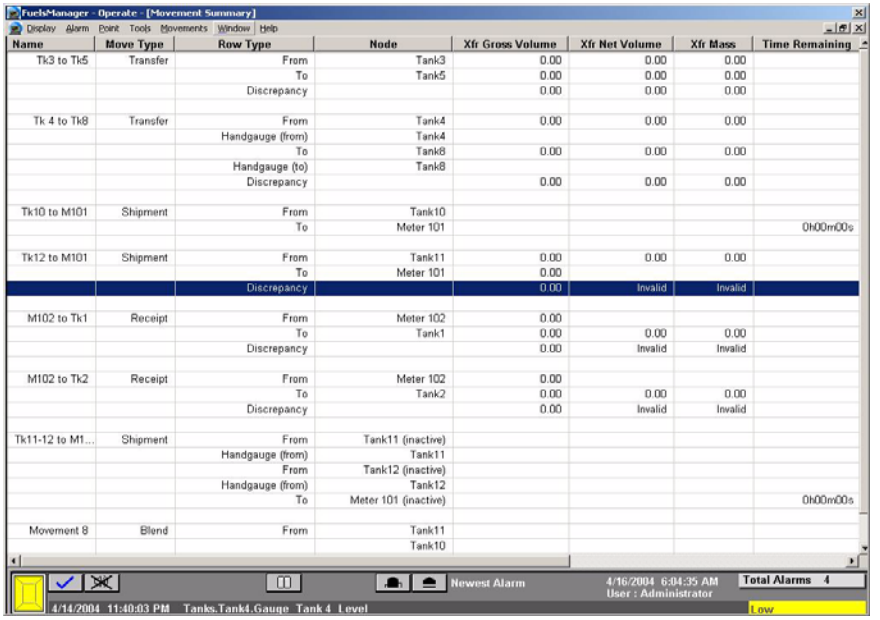


This pop-up menu appears if users right-click while the mouse cursor is positioned on a row that contains movement data.

Movement History Table

The Movement History allows the operator to view all product movements, totals, and discrepancies on a daily basis. Operators can open multiple Movement History tables and visually compare movement data from different days. The Movement History is a database and may be accessed offline in order to create custom reports using 3rd party reporting tools. The Product Movement System writes records to the Movement History at the following times:

- If a movement is stopped, either manually by the operator or automatically on non-zero flow (if the Stop on Non-Zero Flow option is selected).
- If a movement is active at the system close out time. The default close out time is midnight but can be configured to be any single time during the day.


FuelsManager - Operate - [Movement Summary]
Display Alarm Point Tools Movements Window Help
Name | Move Type | Row Type | Node | Xfr Gross Volume | Xfr Net Volume | Xfr Mass | Time Remaining
Tk3 to Tk5 | Transfer | From | Tank3 | 0.00 | 0.00 | 0.00
To | Tank5 | 0.00 | 0.00 | 0.00
Discrepancy | 0.00 | 0.00 | 0.00
Tk 4 to Tk8 | Transfer | From | Tank4 | 0.00 | 0.00 | 0.00
Handgauge (from) | Tank4
To | Tank8 | 0.00 | 0.00 | 0.00
Handgauge (to) | Tank8
Discrepancy | 0.00 | 0.00 | 0.00
Tk10 to M101 | Shipment | From | Tank10
To | Meter 101 | 0h00m00s
Tk12 to M101 | Shipment | From | Tank11 | 0.00 | 0.00 | 0.00
To | Meter 101 | 0.00
Discrepancy | 0.00 | Invalid | Invalid
M102 to Tk1 | Receipt | From | Meter 102 | 0.00
To | Tank1 | 0.00 | 0.00 | 0.00
Discrepancy | 0.00 | Invalid | Invalid
M102 to Tk2 | Receipt | From | Meter 102 | 0.00
To | Tank2 | 0.00 | 0.00 | 0.00
Discrepancy | 0.00 | Invalid | Invalid
Tk11-12 to M1... | Shipment | From | Tank11 (inactive)
Handgauge (from) | Tank11
From | Tank12 (inactive)
Handgauge (from) | Tank12
To | Meter 101 (inactive) | 0h00m00s
Movement 8 | Blend | From | Tank11
Tank10
Newest Alarm
4/16/2004 6:04:35 AM
User : Administrator
Total Alarms 4
4/14/2004 11:40:03 PM Tanks.Tank4.Gauge Tank 4 Level
Low

Default Table Columns

These columns automatically appear in the Movement History table.

Name	Record Type	Node
Move Type	Xfr Gross Volume	Closeout Xfr Gross Volume
Xfr Net Volume	Closeout Xfr Net Volume	Xfr Mass
Closeout Xfr Mass	Xfr Setpoint	Xfr Mode
Start Time	Stop Time	Product
User		

Additional Table Columns

These columns are available in the Movement History table.

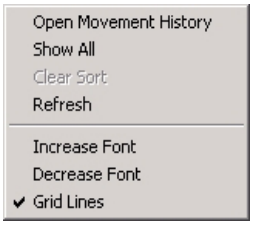
Auto Start	Auto Stop	Closeout Ambient Temp	Closeout Density
Closeout Density Temp	Closeout Gross Volume	Closeout Level	Closeout Mass
Closeout Net Volume	Closeout Temp	Closeout Time	Closeout Water Level
Closeout Water Volume	Closeout Xfr Gross Volume	Closeout Xfr Mass	Comment
Cumulative Xfr Water Volume	Database Tag	Density Units	End Employee ID
End Handgauge Ambient Temp	End Handgauge Ambient Temp Time	End Handgauge Density Temp	End Handgauge Density Temp Time
End Handgauge Density Time	End Handgauge Level Time	End Handgauge Ref Height	End Handgauge Ref Height Time
End Handgauge Std Density	End Handgauge Temp Time	End Handgauge VCF	End Handgauge Volume TOV
End Handgauge Water Level Time	End Shell Correction	Group Name	Initiation Count
Initiation Time	Level Units	Mass Units	Move Type
Name	Node	Opening VCF	Opening Amb Temperature
Opening Density	Opening Density Temperature	Opening Gross Volume	Opening Level
Opening Mass	Opening Net Volume	Opening Roof Volume	Opening Shell Creation
Opening Std. Density	Opening Temp	Opening Volume	Opening Water Level
Opening Water Volume	Order Number	Product	Product Description
Record Id	Record Type	Start Amb. Temperature	Start Amb. Temperature Date/ Time
Start Density	Start Density Date/ Time	Start Density Temperature	Start Employee ID
Start Gross Volume	Start Gross Volume	Start Handgauge Ambient Temp Time	Start Handgauge Density Temp Time

Start Handgauge Density Time	Start Handgauge Level Time	Start Handgauge Ref Height	Start Handgauge Ref Height Time
Start Handgauge Temp Time	Start Handgauge Water Level Time	Start Level	Start Level Date/ Time
Start Mass	Start Net Volume	Start Roof Volume	Start Shell Correction
Start Std Density	Start Std. Density Date/Time	Start Tank Ref. Height	Start Temp
Start Temperature	Start Temperature Date/Time	Start VCF	Start Volume
Start Water Level	Start Water Level Date/Time	Start Water Volume	Stop Time
Temp Units	User Def String (1 - 10)	User Name	Volume Units
Xfr Deviation	Xfr Gross Volume	Xfr Mass Units	Xfr Mode
Xfr Net Volume	Xfr Setpoint	Xfr Setpoint Units	Xfr Volume Units
Xfr Water Volume			

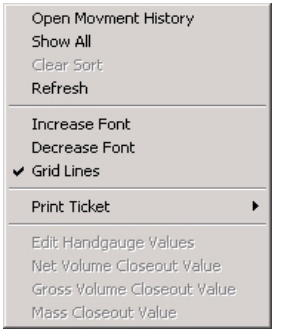
Menu Commands

The following sections detail the use of the Movement History pop-up menu, the contents of this menu differ slightly depending on where on the screen the mouse cursor is positioned when users right-click.

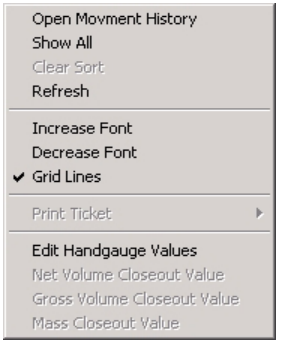
This pop-up menu appears if users right-click while the mouse cursor is positioned on an empty row in the Movement History grid.



This pop-up menu appears if users right-click while the mouse cursor is positioned on a row that contains movement data.



This pop-up menu appears if users right-click while the mouse cursor is positioned on the dividing row between two movement instances, or if no Movement Ticket reports have been configured for the system.

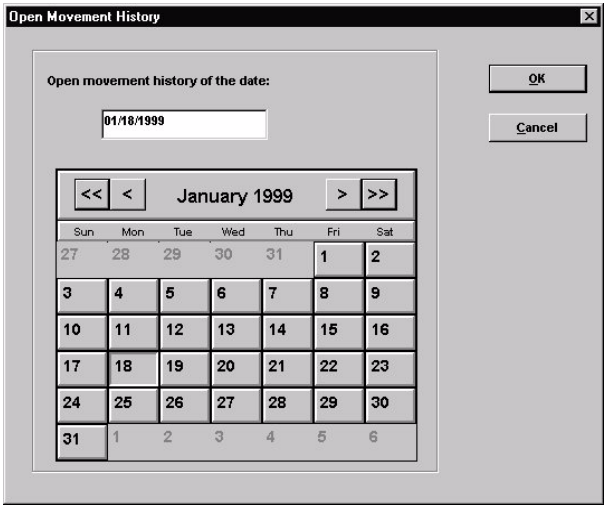


Viewing a Movement History

Step-by-Step

- From the Movements menu, click History. The Open Movement History dialog box appears.
- Select or enter the date. Click OK. The Movement History table appears.

The << and >> buttons advances or goes back one year at a time.
The < and > buttons advances or goes back one month at a time.



Open Movement History dialog box

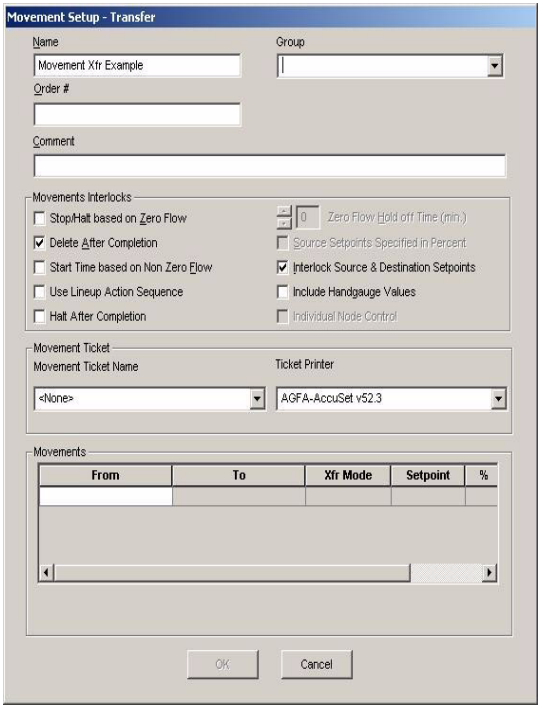
Refreshing the Movement History Table

A refresh causes the Movement History to re-load the information for the selected day from the history database. Only the current Movement History can be refreshed. This option shows movements that have been closed out since the Movement History was opened.

Step-by-Step

- From the Movements History table, right-click on the grid area. The Movements History pop-up menu appears.
- Click Refresh.

Creating and Modifying Movements



Movement Setup dialog box

Step-by-Step

- Select the Movements menu from FuelsManager OPERATE, click Summary. The Movement Summary table appears.
- Select the Movements menu from the Movement Summary table. Select New, and then click on the desired movement type. Or right-click on any area of the Movement Summary table. The Movement Summary pop-up menu will appear. Select New and then click on the desired movement type. The Movement Setup dialog box appears.
- Type in the Name.
- Type or select the Group (Optional).
- Type in the Order # (Optional) and Comment (Optional).
- Select the appropriate options, in the Movements Interlocks Group.
- Select the Movement Ticket Name and Ticket Printer in the Movement Ticket Group (Optional).
- Under Movements, select the desired source or sources in the From field.
- Select the desired destination or destinations in the To field.
- Enter the Xfr Mode and Setpoints.
- Click OK. The system displays the information on the Movement Summary table.

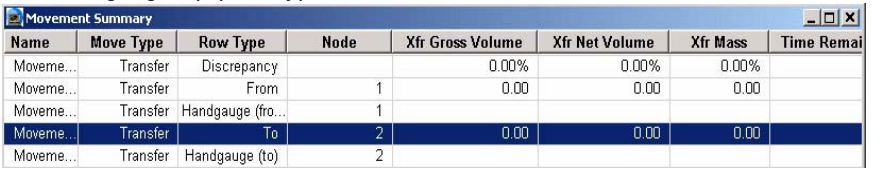
Field	Description
Name	Name lets users type in a specific name for the movement. When a new movement is created from the New menu the system provides the default Name in the form of Movement ###, where ### is a unique ID number. When movement is initiated, this field is cleared.
Group	Group lets users type or select a group name for the movement, which may be used to correlate multiple movements. Clicking the Group arrow allows operators to view all previously defined Groups and displays the selection.
Order #	Order # lets users type in a specific movement order number used for invoicing. Once a movement is initiated, this field is disabled.
Comment	Comment lets users type in a specific comment for the movement.
Stop/Halt Based On Zero Flow	Selecting this option allows the movement to automatically stop when zero flow persists for the Stop Hold Off Time.
Zero Flow Hold Off Time (Min.)	Zero Flow Hold Off Time defines the time the Zero Flow must persist before the system automatically stops the movement. This field is enabled only when Stop Based on Zero Flow is selected. If the movement consists of multiple Source and Destination tanks, Zero Flow must persist for all tanks.
Delete After Completion	Selecting this option allows the system to automatically remove the movement from the summary after the movement is stopped (either manually or automatically – refer to Stop based on Zero Flow).
Source Setpoints Specified In Percent	Selecting this option displays the Transfer Setpoint for Source Nodes in percent. This field is enabled only for Blend movements.
Start Time Based On Non Zero Flow	Selecting this option ensures that the Start Time recorded for the movement will be the time at which a flow was first detected, not the time at which the movement was initiated.
Interlock Source And Destination Setpoints	Selecting this option causes changes in either source or destination setpoint to be automatically reflected in the corresponding destination or source.

Field	Description
Use Lineup Action Sequence	This option is used to work with a specific third-party software application. It activates different tanks in a movement sequentially, instead of simultaneously.
Include Handgauge Values	Selecting this option creates a handgauged node for every tank node involved in the movement. Use this option when users are required to enter handgauged results for the movement.
Halt After Completion	This option is used in conjunction with the Stop Based on Zero Flow option. Selecting this option instructs the system to put the movement into the “Halted” state when zero flow is detected instead of stopping the movement. This lets users enter Handgauge or meter data before stopping the movement. The ‘Use Lineup Action Sequence’ field is enabled when in this field is selected.
Individual Node Control	Selecting this option gives the operator the ability to start and stop tanks in an active movement independent of stopping the movement. This option is only available for Receipt, Shipment, and Blend movement types.
Movement Ticket Name	The Movement Ticket Name list selects the report users want to automatically print when this movement completes. Movement tickets specified here will be automatically printed to the selected printer when the movement is complete. For manual movement ticket printing please see the ‘Movement Tickets’ section.
Ticket Printer	The Ticket Printer list lets users select the destination printer for the selected Movement Ticket report.
From	The From list lets users select the source(s) as determined by the movement type.
To	The To list lets users select the destination(s) as determined by the movement type.
Xfr Mode	The Xfr Mode list lets users select one of the following modes. • Xfr Level • Xfr Volume • Xfr Diff Vol (Differential Volume) • Xfr Mass • Xfr Diff Mass (Differential Mass) • Inactive

Field	Description
Setpoint	The Setpoint lets users set the amount to be transferred from the Source tank into the Destination tank or the amount to be transferred from the Destination tank to the Source tank. Setpoint units depend on the Xfr Mode and the units of the tank selected. The system only allows setpoints for Source or Destination tank points. The system automatically converts the setpoint when changing between different Xfr Modes.
%	The% is only available to Blend movements, and then only if the Source Setpoints Specified in Percent check box is selected. When enabled, users can enter the destination and source setpoint and enter the source setpoints in percentage, for example 80% and 20%.
Units	The Units lists the units associated with the Xfr Mode selection.
Min. and Max. and Reference Volume	This area shows the valid range for the Setpoint or% based upon the cell selected in the movements frame. The Min. and Max. values are only visible when a setpoint cell is selected. Reference volume is only visible for Xfr by Diff. Vol and indicates the current tank volume to which the diff. volume setpoint will be relative to.

Handgauged Movements

When creating a movement and selecting the Include Handgauged Values checkbox, the Movement Summary will include rows for the Handgauge (from) and Handgauged (to) row types.


Movement Summary

Name	Move Type	Row Type	Node	Xfr Gross Volume	Xfr Net Volume	Xfr Mass	Time Remai
Moveme...	Transfer	Discrepancy		0.00%	0.00%	0.00%	
Moveme...	Transfer	From	1	0.00	0.00	0.00	
Moveme...	Transfer	Handgauge (fro...	1				
Moveme...	Transfer	To	2	0.00	0.00	0.00	
Moveme...	Transfer	Handgauge (to)	2				

Modifying Movement Setup

Operators can modify the movement setup for the following modes: Active, Inactive, Disabled, Starting, Stopping, or Halted.

Step-by-Step

- From the Movement Summary table, right-click on the movement row desired in the grid area. The Movements Summary pop-up menu appears.
- Click Setup. The Movement Setup dialog box for the associated movement type appears.
- Make the appropriate changes and click OK.

Initiating a Movement

Operators can initiate the movements that are in the Inactive or Starting mode.

Note! If the movement was setup to Start Based on Non-Zero Flow, Starting displays under State column. When a flow is detected it changes to Active.

Step-by-Step

- From the Movement Summary table, right-click on the movement row. The Movements Summary pop-up menu appears.
- Click Initiate. The system activates and displays Active or Starting in the State column for the associated movement.

Stopping a Movement

Operators can stop movements that are in the Active, Starting, Stopping mode.

Step-by-Step

- From the Movement Summary table, right-click on the movement row. The Movements Summary pop-up menu appears.
- Click Stop. The system displays message: ‘Verify stop of selected movement’.
- Click Yes. The system stops and displays Inactive in the State column for the associated movement.

Resetting a Movement

Operators can reset a movement that is in a Failed state.

Step-by-Step

- From the Movement Summary table, right-click on the movement row. The Movements Summary pop-up menu appears.
- Click Reset. The system resets all default parameters and sets the movement to Inactive in the State column for the associated movement.

Holding for Meter Values

Holding for Meter Values lets users pause a movement that is in an Active or Starting mode.

Step-by-Step

- From the Movement Summary table, right-click on the movement row. The Movements Summary pop-up menu appears.
- Click Hold For Meter Values. The system pauses and displays Halted in the State column for the associated movement.

Entering Meter Values (Net or Gross Volume, Mass)

After a movement has been set to Hold for Meter Values, operators can enter the meter reading.

Step-by-Step

- From the Movement Summary table, right-click on the movement that is holding for the meter values. A pop-up menu appears.
- Select the measurement that the meter node is set to display. This includes Set Gross Volume, Set Net Volume, or Set Mass. A dialog box appears, prompting to enter the selected amount.
- Enter the meter reading and click OK. The system returns to the Movement Summary table, updates the fields, and calculates the discrepancy.

Resuming a Movement

Operators can resume a movement that is in the Halted mode.

Step-by-Step

- From the Movement Summary table, right-click on the movement row. The Movements Summary pop-up menu appears.
- Click Resume. The system resumes and displays Active in the State column for the associated movement.

Formatting Movement Tables and Data

Filtering Movements

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the desired column heading. The pop-up menu appears.
- Click Filter. The Column Filter dialog box appears.
- Select the desired item or items that are to be displayed from the Do Not Display list.
- Click the > button (right arrow). The system moves the selected item(s) to the Display list. Click >> button to move all items from the Do Not Display list to the Display list.
- Click OK. The selected item or items display on the Movement Summary or Movement History table.

Note! Columns that display numeric and time/date related data cannot be filtered, for example Temperature and Xfr Gross Volume.

Note! Filtered columns are denoted with an asterisk in the column heading.

Removing Column Specific Filter

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the desired column heading. The pop-up menu appears.
- Click Remove Filter. The filtered item or items display on the Movement Summary or Movement History table.

Note! Filtered columns are denoted with an asterisk in the column heading.

Showing All Movements

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the grid area. The pop-up menu appears.
- Click Show All. The system displays all information.

Sorting by Column

Step-by-Step

- From the Movement Summary or Movement History table, click on the desired column heading to sort based on that column.

Note! That the column sorts in ascending or descending order only.

Clearing the Sort

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the grid area. The pop-up menu appears.
- Click Clear Sort. The system returns back to the original display.

Deleting a Movement

Operators can delete the movements that are in the Disabled or Inactive mode.

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the movement row desired in the grid area. The pop-up menu appears.
- Click Delete. The system deletes and removes the associated movement from the Movement Summary or Movement History table.

Adding a Column

Step-by-Step

- From the Movement Summary or Movement History table, right-click on any column heading. The pop-up menu appears.
- Click Add Column. The Select a Column dialog box appears.
- Click the down arrow. A drop-down menu appears.
- Select the new column heading from the list.
- Click OK. The system adds the new column heading and its data at the far right of the Movement Summary or Movement History table.

Inserting a Column

Step-by-Step

- From the Movement Summary or Movement History table, position the cursor to insert the new column.
- Right-click on the column heading. The pop-up menu appears.
- Click Insert Column. The Select a Column dialog box appears.
- Click the down arrow. A drop-down menu appears.
- Select the new column heading from the list.
- Click OK. The system inserts the new column heading and its data to the left of the currently selected column.

Replacing a Column

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the desired column heading. The pop-up menu appears.
- Click Modify Column. The Select a Column dialog box appears.
- Click the down arrow. A drop-down menu appears.
- Select a new column heading from the list.
- Click OK. The system replaces the column heading and its data with the new selection.

Deleting a Column

Operators can delete any column except for Name, Row Type, and Node.

Step-by-Step

- From the Movement Summary or Movement History table, right-click on the desired column heading. The pop-up menu appears.
- Click Delete Column. The system displays message: ‘Delete column: Level’.
- Click OK. The system deletes the column from the Movement Summary or Movement History table.

Entering a Column Alias

Operators can change the column headings by entering an alias for that column.

Step-by-Step

- On the Movement Summary or Movement History table, right-click the column heading to enter an alias. The pop-up menu appears.
- Select Alias Column. The Column Header Alias dialog box appears.
- Enter the alias and click OK. The system closes the dialog box and replaces the old column heading with the alias. Click reset to return the column heading to its original name.

Increasing Font Size

Operators can increase the font size on the Movement Summary or Movement History table.

Step-by-Step

- Right-click on any area of the Movement Summary or Movement History table. The pop-up menu will appear. Select Increase Font. The system increases the font size throughout the Movement Summary or Movement History table.
- Repeat this step until the desired font size.

Note! The Product Movement System has a maximum font size. Attempting to increase the font beyond this limit will have no effect.

Decreasing Font Size

Step-by-Step

- Right-click on any area of the Movement Summary or Movement History table. The pop-up menu will appear. Select Decrease Font. The system decreases the font size throughout the Movement Summary or Movement History table.
- Repeat this step until the desired font size.

Note! The Product Movement System has a minimum font size. Attempting to decrease the font beyond this limit will have no effect.

Toggling Grid Lines On and Off

Step-by-Step

- Right-click on any area of the Movement Summary or Movement History table. The pop-up menu will appear. Select Grid Lines.
- The system removes or adds the grid lines in the Movement Summary or Movement History table.

Entering User String Data

Operators can enter and store user data to a movement from the Movement Summary table. This feature allows the user to store any string of data or information that is needed to have while that movement is active.

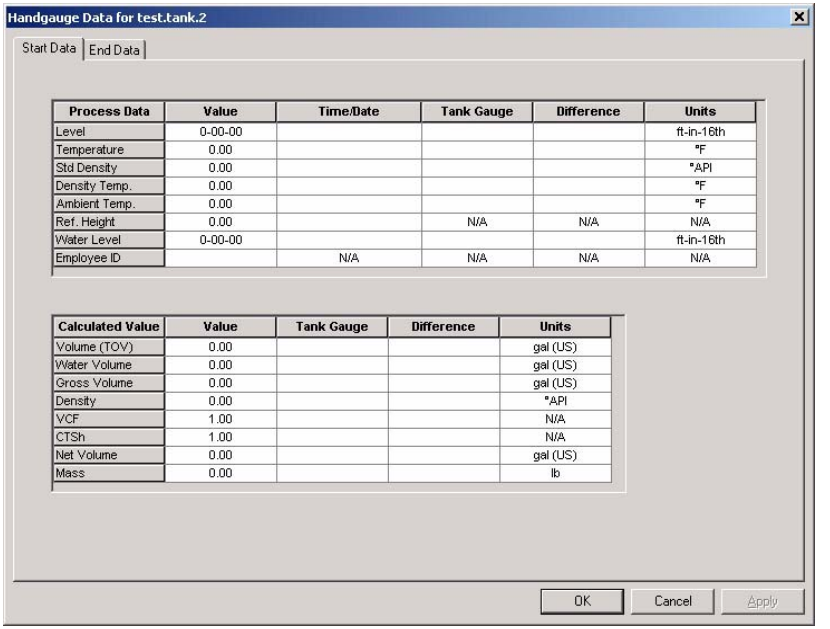
Step-by-Step

- In the Movement Summary table, select one of the rows in the movement.
- Right-click the selected row. The Movement Summary pop-up menu will appear. Select User Data. The User Data dialog box appears for the selected movement.
- Enter any of the necessary data. and click OK. The system attaches the user data to the movement.

Note! Open the User Data dialog box again to view the information stored.

Entering Handgauge Values

Operators can enter the results of a handgauge measurement into the Handgauge (from) and Handgauge (to) nodes.


Handgauge Data for test.tank.2
Start Data
End Data
Process Data | Value | Time/Date | Tank Gauge | Difference | Units
Level | 0-00-00 | | | | ft-in-16th
Temperature | 0.00 | | | | °F
Std Density | 0.00 | | | | °API
Density Temp. | 0.00 | | | | °F
Ambient Temp. | 0.00 | | | | °F
Ref. Height | 0.00 | | N/A | N/A | N/A
Water Level | 0-00-00 | | | | ft-in-16th
Employee ID | | N/A | N/A | N/A | N/A
Calculated Value | Value | Tank Gauge | Difference | Units
Volume (TOV) | 0.00 | | | gal (US)
Water Volume | 0.00 | | | gal (US)
Gross Volume | 0.00 | | | gal (US)
Density | 0.00 | | | °API
VCF | 1.00 | | | N/A
CTSh | 1.00 | | | N/A
Net Volume | 0.00 | | | gal (US)
Mass | 0.00 | | | lb
OK
Cancel
Apply

Handgauge Data dialog box

Step-by-Step

- In the Movement Summary or Movement History table, right-click over the Handgauge (from) row for the movement where values are to be entered. The pop-up menu appears.
- Select Edit Handgauge Values. The Handgauge Data dialog box appears for the selected node.
- In the Process Data grid, enter the values from the handgauge. The results of the values entered in the Process Data section are automatically calculated and displayed in the Calculated Value Section.
- After entering all handgauged values, click OK.

Note! Users can also enter handgauge values for movements that have been stopped from the Movement Summary or Movement History table.

Toggling Automatic Values

Operators can toggle a movement to show and hide the automatic values. If the automatic values are hidden, only the handgauged values will appear.

Step-by-Step

- In the Movement Summary table, right-click any of the rows in the movement. The Movements Summary pop-up menu appears.
- Select Automatic Values. The rows with the automatic values disappear or appear.

Toggling Handgauged Values

Operators can toggle a movement to show and hide the handgauged values. If the handgauged values are hidden, only the automatic values will appear in the Movement Summary table.

Step-by-Step

- In the Movement Summary table, right-click any of the rows in the movement. The Movements Summary pop-up menu appears.
- Select Handgauge Values. The rows with the automatic values disappear or appear. Handgauged values only appear if the checkbox Include Handgauge Values was checked in the Movement Setup dialog box.

Note! Users cannot have both the handgauged and automatic values toggled off at the same time. If the handgauged values are hidden, make sure that the automatic values are visible.

Viewing Discrepancies in Percentages

The Movement System defaults to showing any discrepancy in the Movement Summary table in amounts. Operators can change this to show discrepancies by percentages.

Step-by-Step

- In the Movement Summary table, right-click any of the rows in the movement. The Movements Summary pop-up menu appears.
- Select Discrepancy as Percentage. The Volumes and Mass columns switch to percentages.

Note! To view the amounts again, just follow the same two steps.

Movement Tickets

Note! The format and types of movement tickets available at the load faculty are configured by the Administrator or Supervisor. This section details the pre-packaged movement tickets.

From the Movement History table, operators can print movement tickets that contain summaries of product movements. The movement tickets are general movement reports and can be applied to any movement type. There are four different movement tickets.

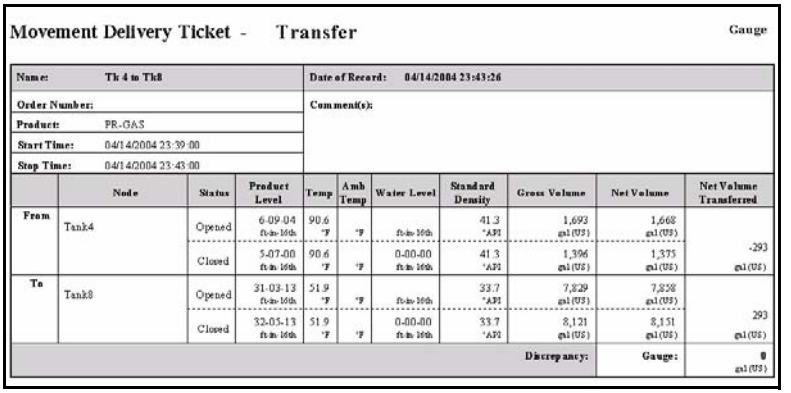
- Movement Gauge Only
- Movement Gauge-Handgauge Only
- Movement Handgauge Only
- Product Movement

Most movement tickets display the following data

- Movement Name
- Movement Initiation Time
- Product
- Movement Type

Ticket reports also contain a table that lists the different points and displays the following fields from each point from the Opened and Closed date and time.

- Node
- Status
- Product Level
- Temperature
- Water Level
- Standard Density
- Gross Volume
- Net Volume
- Net Volume Transferred
- Total Discrepancy



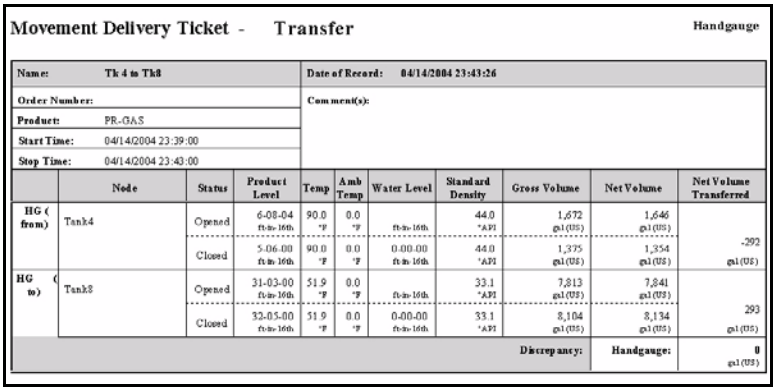
Movement Delivery Ticket - Transfer

Gauge

Name:	Tk 4 to Tk8
Order Number:	
Product:	PR-GAS
Start Time:	04/14/2004 23:39:00
Stop Time:	04/14/2004 23:43:00
Date of Record:	04/14/2004 23:43:26
Comment(s):	

	Node	Status	Product Level	Temp	Amb Temp	Water Level	Standard Density	Gross Volume	Net Volume	Net Volume Transferred
From	Tank4	Opened	6-09-04 ft-in-16th	90.6 °F	°F	ft-in-16th	41.3 °API	1,693 gal (US)	1,668 gal (US)	
		Closed	5-07-00 ft-in-16th	90.6 °F	°F	0-00-00 ft-in-16th	41.3 °API	1,396 gal (US)	1,375 gal (US)	-293 gal (US)
To	Tank8	Opened	31-03-13 ft-in-16th	51.9 °F	°F	ft-in-16th	33.7 °API	7,829 gal (US)	7,858 gal (US)	
		Closed	32-05-13 ft-in-16th	51.9 °F	°F	0-00-00 ft-in-16th	33.7 °API	8,121 gal (US)	8,151 gal (US)	293 gal (US)
								Discrepancy:	Gauge:	0 gal (US)

Movement Gauge Only Ticket



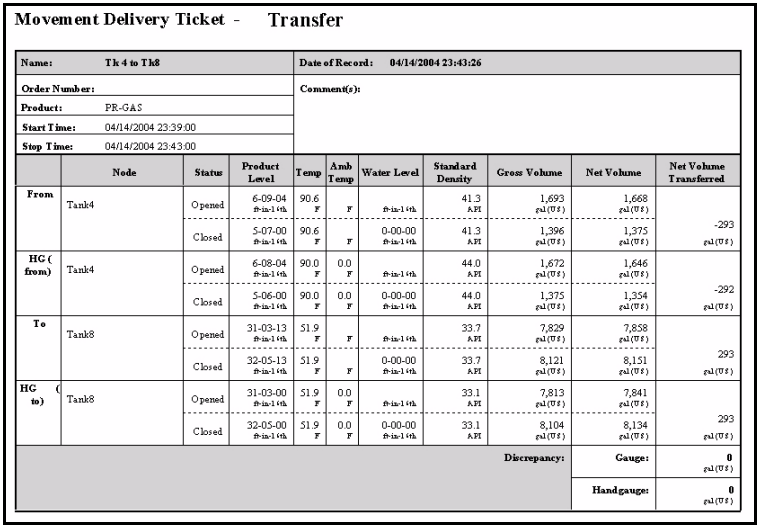
Movement Delivery Ticket - Transfer

Handgauge

Name:	Tk 4 to Tk8
Order Number:	
Product:	PR-GAS
Start Time:	04/14/2004 23:39:00
Stop Time:	04/14/2004 23:43:00
Date of Record:	04/14/2004 23:43:26
Comment(s):	

	Node	Status	Product Level	Temp	Amb Temp	Water Level	Standard Density	Gross Volume	Net Volume	Net Volume Transferred
HG (from)	Tank4	Opened	6-08-04 ft-in-16th	90.0 °F	0.0 °F	ft-in-16th	44.0 °API	1,672 gal (US)	1,646 gal (US)	
		Closed	5-06-00 ft-in-16th	90.0 °F	0.0 °F	0-00-00 ft-in-16th	44.0 °API	1,375 gal (US)	1,354 gal (US)	-292 gal (US)
HG (to)	Tank8	Opened	31-03-00 ft-in-16th	51.9 °F	0.0 °F	ft-in-16th	33.1 °API	7,813 gal (US)	7,841 gal (US)	
		Closed	32-05-00 ft-in-16th	51.9 °F	0.0 °F	0-00-00 ft-in-16th	33.1 °API	8,104 gal (US)	8,134 gal (US)	293 gal (US)
								Discrepancy:	Handgauge:	0 gal (US)

Movement Handgauge Only Ticket



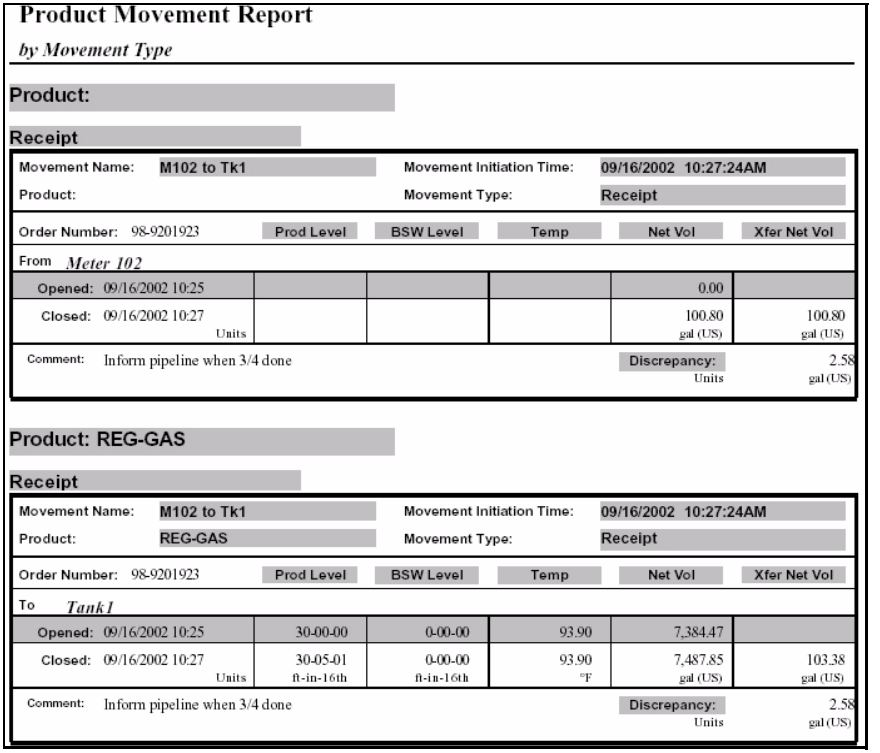
Movement Delivery Ticket - Transfer

Name:	Tk 4 to Tk8
Order Number:	
Product:	PR-GAS
Start Time:	04/14/2004 23:39:00
Stop Time:	04/14/2004 23:43:00
Date of Record:	04/14/2004 23:43:26
Comment(s):	

	Node	Status	Product Level	Temp	Amb Temp	Water Level	Standard Density	Gross Volume	Net Volume	Net Volume Transferred
From	Tank4	Opened	6-09-04 ft-in-16th	90.6 F	F	ft-in-16th	41.3 API	1,693 gal (US)	1,668 gal (US)	
		Closed	5-07-00 ft-in-16th	90.6 F	F	0-00-00 ft-in-16th	41.3 API	1,396 gal (US)	1,375 gal (US)	-293 gal (US)
HG (from)	Tank4	Opened	6-08-04 ft-in-16th	90.0 F	0.0 F	ft-in-16th	44.0 API	1,672 gal (US)	1,646 gal (US)	
		Closed	5-06-00 ft-in-16th	90.0 F	0.0 F	0-00-00 ft-in-16th	44.0 API	1,375 gal (US)	1,354 gal (US)	-292 gal (US)
To	Tank8	Opened	31-03-13 ft-in-16th	51.9 F	F	ft-in-16th	33.7 API	7,829 gal (US)	7,858 gal (US)	
		Closed	32-05-13 ft-in-16th	51.9 F	F	0-00-00 ft-in-16th	33.7 API	8,121 gal (US)	8,151 gal (US)	293 gal (US)
HG (to)	Tank8	Opened	31-03-00 ft-in-16th	51.9 F	0.0 F	ft-in-16th	33.1 API	7,813 gal (US)	7,841 gal (US)	
		Closed	32-05-00 ft-in-16th	51.9 F	0.0 F	0-00-00 ft-in-16th	33.1 API	8,104 gal (US)	8,134 gal (US)	293 gal (US)
								Discrepancy:	Gauge:	0 gal (US)
									Handgauge:	0 gal (US)

.

Movement Gauge-Handgauge Ticket



Product Movement Report

by Movement Type

Product:

Receipt

Movement Name:	M102 to Tk1		Movement Initiation Time:	09/16/2002 10:27:24AM	
Product:			Movement Type:	Receipt	
Order Number: 98-9201923	Prod Level	BSW Level	Temp	Net Vol	Xfer Net Vol
From *Meter 102*					
Opened: 09/16/2002 10:25				0.00	
Closed: 09/16/2002 10:27				100.80	100.80
Units				gal (US)	gal (US)
Comment: Inform pipeline when 3/4 done				Discrepancy:	2.58
				Units	gal (US)

Product: REG-GAS

Receipt

Movement Name:	M102 to Tk1		Movement Initiation Time:	09/16/2002 10:27:24AM	
Product:	REG-GAS		Movement Type:	Receipt	
Order Number: 98-9201923	Prod Level	BSW Level	Temp	Net Vol	Xfer Net Vol
To *Tank1*					
Opened: 09/16/2002 10:25	30-00-00	0-00-00	93.90	7,384.47	
Closed: 09/16/2002 10:27	30-05-01	0-00-00	93.90	7,487.85	103.38
Units	ft-in-16th	ft-in-16th	°F	gal (US)	gal (US)
Comment: Inform pipeline when 3/4 done				Discrepancy:	2.58
				Units	gal (US)

Preview a Movement Ticket Before Printing

Step-by-Step

- From the Movement History table, select the movement instance that is to be previewed.
- On the Movement History pop-up menu, click Print Preview Ticket and select the ticket to be previewed.
- The ticket will display as a report to be previewed by the user.

Printing a Movement Ticket

Step-by-Step

- From the Movement History table, select the movement instance that is to be printed.
- On the Movement History pop-up menu, click Print Ticket and select the ticket to be printed.
- Select the correct printer and options from the Print Setup dialog box.
- Click OK. The system prints the movement ticket.

Practical Movement Examples

Example 1 – Simple Tank Transfer

- Create a new movement of type Transfer.
- Select the required Source Tank and the required Destination Tank.
- Select the required transfer mode and enter the level, volume or mass value for the movement to stop for either the source or destination tank.
- Initiate the transfer, the Product Movement System will capture the starting tank data values and show the movement as Active on the Movement Summary.
- Operators can monitor the progress of the transfer from the Movement Summary. In particular the summary screen shows the amounts already transferred, the estimated time to complete the transfer and any discrepancy between the amount transfer out of the source tank and the amount received in the destination tank.
- As the transfer nears its completion the Product Movement System will provide a warning alarm a short time before the ending setpoint.
- When the transfer is complete the Product Movement System will provide a shutdown alarm indicating that the requested amount of product has been transferred from the source tank. Stop the transfer, the Product Movement System will capture the stop values and final discrepancy data.
- The transfer data for this movement has been archived in the Movement History database and can now be viewed from the Movement History.

Example 2 – Product Receipt

- Create a new movement of type Receipt
- Select the required Source Unit and the required Destination Tanks. A unit is simply a name given to the source of the product transfer (i.e. Dock, Truck Rack, Ship etc.). Operators can select multiple tanks as the destinations; the Product Movement System will track the product receipt in all selected tanks simultaneously.
- Select the required transfer mode and enter the level, volume or mass value for the movement to stop for each of the destination tanks.
- Initiate the receipt, the Product Movement System will capture the starting tank data values and show the movement as Active on the Movement Summary.
- Operators can monitor the progress of the receipt from the Movement Summary. In this example there is no discrepancy row displayed. This is because the source of the receipt is a unit node and therefore has no measurement device. Discrepancies can only be calculated when there is a measurement device on both the source and destination nodes.
- The receipt movement shows a total row. This row sums the total amount of product received in each of the tanks.
- Typically operations will run the receipt into one of the destination tanks then switch over to the other. The Movement Summary will provide independent

warning and shutdown alarms for each of the destination tanks, allowing the operator to administer the switchover process.

- When all of the destination tanks have reached their shutdown setpoints stop the receipt. The Product Movement System will capture the stop values and final totals data.

Example 3 – Shipment via a Meter Node.

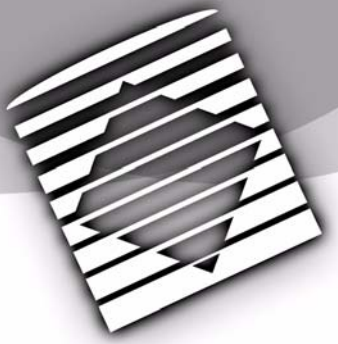
Create a new movement of type Shipment

- Select the required Source Tanks and Destination Meter Node. A meter node is a movement node containing a measurement device that can be manually or automatically updated. Operators can select multiple tanks as the source for a shipment; the Product Movement System will track the shipment from all selected tanks simultaneously.
- Select the required transfer mode and enter the level, volume or mass value for the movement to stop for each of the source tanks.
- Meter nodes can be configured to reset the volume or mass values when the movement starts (able to be reset) or to accumulate the values until a rollover point is reached. In the example we will assume the meters are able to be reset.
- Initiate the shipment, the Product Movement System will capture the starting tank data values, reset any meter node volume or mass data to zero and show the movement as Active on the Movement Summary.
- Operators can monitor the progress of the shipment from the Movement Summary. Since the shipment has a measurement device at both the tank and meter nodes a discrepancy row is shown on the Movement Summary. This row shows the difference between what has been transferred out of the source tanks and what has passed through the meter.
- If the meter data is being manually updated, users should expect the discrepancy to be large until the meter data is updated. Electing to update the meter values periodically over the span of the shipment, say hourly, provides consolidation information the may be useful in the early detection of leaks or incorrect line-ups
- As with example 2 above the Movement Summary will provide independent warning and shutdown alarms for each of the source tanks.
- When all of the source tanks have reached their shutdown setpoints select “Hold for Meter Values’. This action halts the movement and allows users to enter the final meter volume or mass data.
- Once the final meter data has been entered, stop the shipment. The Product Movement System will capture the stop values and final meter data.

Command Summary

Movements ¦ Summary
Displays the real-time movement data.

Movements ¦ History
Displays all product movements, totals, and discrepancies on a daily basis.



Working with Leak Detection

(Professional Edition Only)

Understanding Leak Detection

FuelsManager Leak Detection is designed to monitor tank farms for leak conditions and send alerts of potential environmental hazards. Leak Detection basic functions include:

- Monitoring level, temperature, water level and density from field instruments or operator entry
- Performing analysis of sensor data, looking for conditions that might indicate a leak
- Comparing instrument readings and calculations against alarm limits
- Annunciating, processing and logging alarms
- Providing reports

Leak Detection reads data directly from historical data, applying filtering algorithms, calculating various statistics and applying qualifying logic. Alarm processes running within the systems database can monitor the resultant calculations. This includes data manually entered, data calculated in real-time and data received via communication interfaces.

Leak Detection's primary objective is to detect a leak at rates as low as 0.2 gallons per hour. The ability to detect leaks at these rates depends upon the physical characteristics of the tank (size, shape, above/below ground, materials used in construction, etc.), the types of instruments available to measure the properties of the product in the tank, the resolution and stability of the instruments and how the tank is used.

Tank Analysis Methods

Leak Detection integrates with third party leak detection systems and instrumentation to detect and calculate leaks based on:

- Volumetric Analysis
- Mass Analysis

Volumetric Analysis

Volumetric analysis requires measuring the level and temperature, calculating the Net Standard Volume, analyzing the tank data during periods of inactivity and searching for losses.

If a volumetric analysis is required without the rounding of the VCF, an operator has the option to chose an un-rounded net volume. This will provide data with more precise measurements when reporting leak date.

Detection of leaks in bulk storage tanks using volumetric changes depends upon a number of factors, including the dimensions of the tank and the Net Standard Volume derived from the level and temperature.

The resolution, stability and accuracy of the level and temperature instruments determine the effectiveness of utilizing the volumetric analysis method. An accurate gauge with high resolution yields the best results for static measurement. The accuracy of the tank strapping table will also affect the accuracy of the volume calculation. Errors in the strapping table could appear as leaks.

Some factors have more influence than others, depending upon the application. In large tanks (over 50,000 gallons), the resolution of the level measurement is the limiting factor. For example, for a 1,000,000-gallon cylindrical tank, 40 feet in height, a sixteenth of an inch (1/16”) equates to almost 150 gallons. This means that a long time period is needed to effectively detect a leak. Another limiting factor is the resolution and stability of the temperature sensor. Changes in both the product and the tank shell temperature will affect the volume of the product in the tank.

Note! Leak Detection detects leak rates as low as 0.2 gallons per hour for tanks up to 75,000 gallons.

Note! Leak Detection is certified on tanks up to 3,000,000 gallons for mass analysis.

Mass Analysis

Mass analysis is based upon measuring the pressure of the product and applying the conservation of mass principle. In bulk storage tanks, the Total Observed Volume will fluctuate with changes in the temperature of the product. The mass of the product in the tank is constant, so changes in the temperature of the product have no effect on the total mass in the tank.

Note! All probes used for analysis are approved by an independent third party certified to meet all EPA leak detection standards.

Level Probes

Currently, Leak Detection is approved with two different level probes. However, the same analysis methods can be applied to tanks gauged with any level measuring device, though no certification can be provided by FuelsManager. The level probes include:

- MTS DDA compatible
- Barton Instruments 3500

The certificate rate and required test time are based on the tank size and measuring probe. The following table shows the gauge types and the corresponding certification parameters.

Gauge Name	Tank Volume	Cert. Rate	Test Time	Max Temp Change	Test Method
MTS DDA - Type 1	0-75,000 gals	0.2 gal/hr	24hrs	(+/-)3.6	Volumetric
MTS DDA - Type 2	0-75,000 gals	0.2 gal/hr	24hrs	(+/-)0.1	Volumetric
Barton 3500 - Type 1	0-75,000 gals	0.2 gal/hr	24hrs	(+/-)6.9	Volumetric
Barton 3500 - Type 2	0-3,000,000 gals	3.0 gal/hr	48hrs	(+/-)1.5	Volumetric
Barton 3500 - Type 3	0-3,000,000 gals	3.0 gal/hr	48hrs	(+/-)1.0	Mass

Tank Analysis Types

The analysis type selected by the operator determines the method used to search for a leak. When configuring a tank, the following analysis types can be set:

- Static
- Continuous
- Real-Time

Note! Real-Time analysis can only be configured and performed by an administrator.

Static Analysis

A Static analysis requires the tank to be shut down (out-of-service) and stable for the time period or amount of time required for the analysis. Typically, a total of 24 hours of valid data or quite time is needed to perform a relevant static tank analysis. After analyzing valid historical data over a minimum 24 hour time period, the system can report valid leak rates.

Note! A tank typically requires four hours to become stable for adequate Static analysis.

Continuous Analysis

Continuous analysis allows the operator to keep the tank in use while performing an analysis. Typically, a total of 24 hours of valid data or quite time is needed to perform a relevant continuous analysis. Continuous analysis should normally be done during a 30 day time period. During this time, the system identifies valid down times from historical data during regular operation and builds the results.

Note! Continuous analysis types do not analyze tanks in real-time. Like Static types, Continuous types are manual operations, not automatic.

Real-Time Analysis

Real-Time analysis allows for an automatic on-going analysis of tanks. Only an Administrator or Supervisor can configure and perform Real-Time analysis. Unlike Static and Continuous types, Real-Time works constantly to analyze the leak rate. A total of 24 hours of valid data or quite time is needed to perform a relevant real-time analysis over a 60 day time period. Tests are performed automatically every day at 12:00 am and at the time defined for Auto Printing. If the Leak Data alarm is enabled, an alert is given every day at 12:00 am to notify the operator that there is not enough valid data or quiet time data from the tank to produce a valid Leak Test Report. A Leak Rate alarm, if enabled, also notifies the operator if the calculated leak rate exceeds the preset alarm limit.

Using Leak Detection

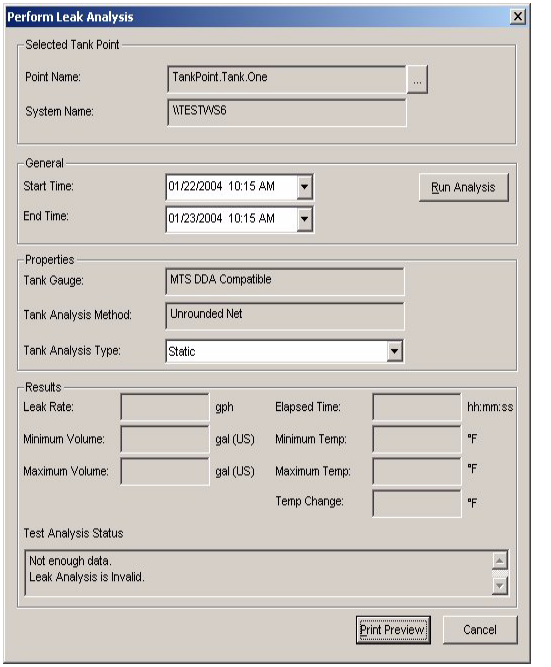
Leak Analysis Tests

Operators can perform two types of leak analysis test:

- Static
- Continuous

Static and Continuous test methods are tests that have to be initiated by the operator. These tests are run from the Perform Leak Analysis dialog box utilizing the Run Analysis button.

Note! If configured by an Administrator or Supervisor, Real-Time leak analysis are performed automatically at 12:00 AM and at the time defined for Auto Printing. Operators need to consult an Administrator or Supervisor to configure and perform Real-Time leak analysis test.



Perform Leak Analysis dialog box

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Field	Description
Point Name	Used to display the name of the currently selected tank point. To select a new tank point, press the "…" button and the Select Tank Point dialog box will appear.
System Name	Displays the name of the currently selected DataManager System
Start Time	Used to select the starting date and time of the leak test. The Start Time date time picker control will default to 12:00am today minus the required leak test span for the tank gauge selected.

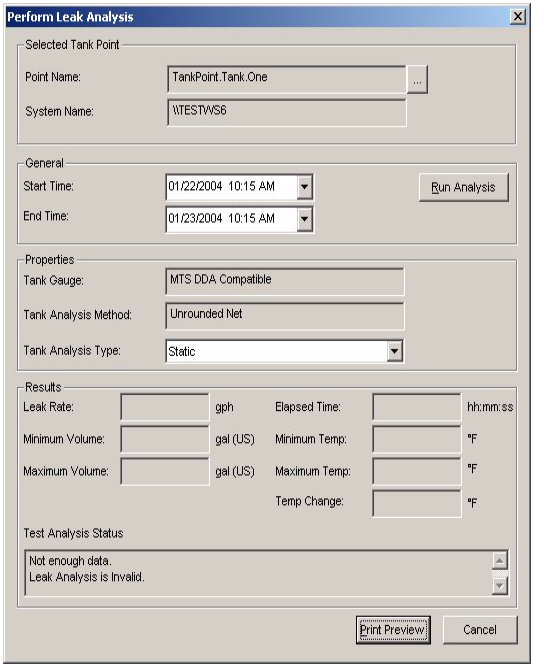
Field	Description
End Time	Used to select the ending date and time of the leak test. The End Time date time picker control will default to 12:00am today.
Run Analysis	The Run Analysis button will initiate the leak test analysis with the current state of the dialog box. The Run Analysis button will be disabled until the Start Time, End Time or the Tank Analysis Type has changed.
Tank Gauge	Displays the tank gauge that will be used in the leak test
Tank Analysis Method	Displays the leak analysis method that will be used in the leak test
Tank Analysis Type	Supported types in this field include: Static and Continuous. Regardless of how the tank was initially configured, the selection from this field override all other settings.
Leak Rate	Displays the resulting calculate leak rate after the Run Analysis button is clicked
Elapsed Time	Displays the resulting elapsed time of the test after the Run Analysis button is clicked
Minimum Volume	Displays the resulting minimum volume after the Run Analysis button is clicked
Minimum Temperature	Displays the resulting minimum temperature after the Run Analysis button is clicked
Maximum Volume	Displays the resulting maximum volume after the Run Analysis button is clicked
Maximum Temperature	Displays the resulting maximum temperature after the Run Analysis button is clicked
Temperature Change	Displays the resulting temperature change after the Run Analysis button is clicked
Test Analysis Status	Displays the status of the leak test that was analyzed after the Run Analysis button is clicked
Print Preview	The Print Preview button will display a report based off the current leak test result in a preview mode. If the report needs to be printed, it can be printed from the Print Preview. The Print Preview button will be disabled until a leak test has been run.
Cancel	The Cancel button ignores the changes and dismisses the dialog box.

Performing Static/Continuous Leak Analysis Test

Step-by-Step

- From FuelsManager OPERATE, select the Tools menu.
- Select Perform leak rate analysis. The Perform Leak Analysis dialog box appears.

Continued...



Perform Leak Analysis dialog box

...Continued

- Click the “…” button, next to the Point Name field. The Select Tank Point dialog box will appear.
- Select the tank point for which the static leak analysis is to be performed. Verify the selected tank displays in the Point Name field.
- Select a Start Time and an End Time.
- Select a Tank Analysis Type. Either Static or Continuous analysis types can be selected regardless of how the tank point was originally configured from the Edit Tank Point - Leak Detection page.
- Click the Run Analysis button to perform the leak test with the criteria selected. The following results display in the Test Analysis Status field upon execution: leak rate, elapsed time, minimum volume, maximum volume, minimum temperature, maximum temperature, temperature change and the test analysis result.
- If a print preview is desired, click the Print Preview button. This will display the current results graphically, as detailed in the ‘Leak Test Report ‘ section. The report can be printed from the dialog box if needed.

Leak Test Reports

Leak Test Reports include the following:

- Static Report
- Continuous Report
- Real-Time Report

Note! When in Real-time mode, reports may be scheduled to print automatically.

Field	Description
Point Name	Used to display the name of the currently selected tank point. To select a new tank point, press the “…” button and the Select Tank Point dialog box will appear.
System Name	Displays the name of the currently selected FuelsManager System
Start Time	Used to select the starting date and time of the leak test. The Start Time date time picker control will default to 12:00am today minus the required leak test span for the tank gauge selected.
End Time	Used to select the ending date and time of the leak test. The End Time date time picker control will default to 12:00am today.

Leak Test Report - Static

4/15/2004 12:07:10

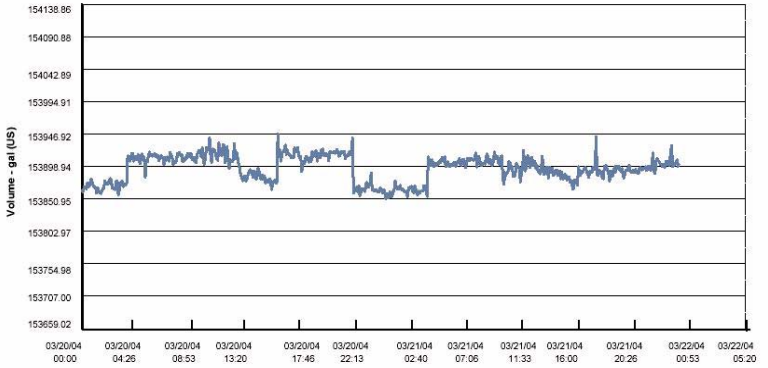
Tank.1.TankPoint — **Tank 1**

Test Result:

Calculated Leak Rate:	-0.067	gph (US)	Leak Threshold:	1.500	gph (US)
Test Result:	Passed		Certification Rate:	3.000	gph (US)

Test Data Summary:

Test Period Start Time:	03/20/2004 0:00		Minimum Temperature:	67.33	°F
Test Period End Time:	03/22/2004 0:00		Maximum Temperature:	67.93	°F
Test Period:	48.00	hour	Delta Temperature:	0.60	°F
Product Level Used - Start:	3-02-16	ft-in-16th	Minimum Volume Used:	153,850.95	gal (US)
Product Level Used - End:	3-03-00	ft-in-16th	Maximum Volume Used:	153,946.92	gal (US)



Static Test Chart (03/20/04 00:00 to 03/22/04 00:00)

Tank Characteristics :

Date Installed:	January 01, 1970		Lining Material:	EC125U	
Tank Radius:	86-00-00	ft-in-16th	Construction Material:	Mild Steel	
Tank Length/Height:	13-00-00	ft-in-16th	Cathodic Protection:	Yes	
Tank Volume:	596,000.00	gal (US)	Overfill Protection:	Yes	
Automatic Tank Gauge:	Barton Model 3500 (Type3)		Spill Protection:	Yes	
Leak Detection System:	Version 6.0.0				

FuelsManager

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Static Report

t

Leak Test Report - Continuous

4/15/2004 12:08:15

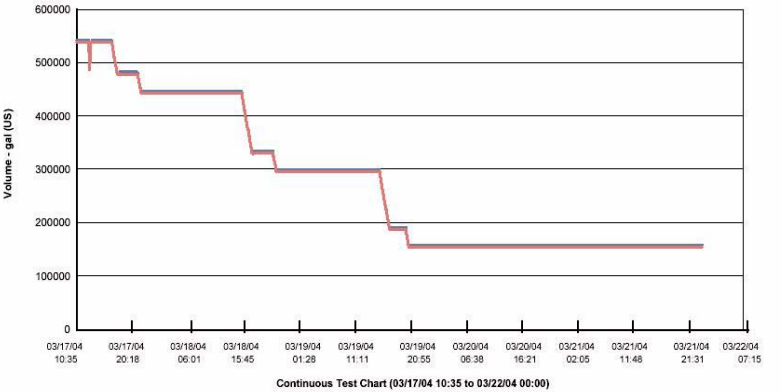
Tank.1.TankPoint — **Tank 1**

Test Result:

Calculated Leak Rate:	-3.015	gph (US)	Leak Threshold:	1.500	gph (US)
Test Result:	Failed		Certification Rate:	3.000	gph (US)

Test Data Summary:

Test Period Start Time:	02/22/2004 0:00		Minimum Temperature:	66.99	°F
Test Period End Time:	03/22/2004 0:00		Maximum Temperature:	67.93	°F
Test Period:	696.00	hour	Delta Temperature:	0.94	°F
Product Level Used - Start:	11-09-02	ft-in-16th	Minimum Volume Used:	153,799.05	gal (US)
Product Level Used - End:	3-03-00	ft-in-16th	Maximum Volume Used:	538,798.69	gal (US)



Continuous Test Chart (03/17/04 10:35 to 03/22/04 00:00)

Tank Characteristics :

Date Installed:	January 01, 1970		Lining Material:	EC125U	
Tank Radius:	86-00-00	ft-in-16th	Construction Material:	Mild Steel	
Tank Length/Height:	13-00-00	ft-in-16th	Cathodic Protection:	Yes	
Tank Volume:	596,000.00	gal (US)	Overfill Protection:	Yes	
Automatic Tank Gauge:	Barton Model 3500 (Type3)		Spill Protection:	Yes	
Leak Detection System:	Version 6.0.0				

FuelsManager

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Continuous Report

Leak Test Report - Realtime

4/15/2004 14:19:24

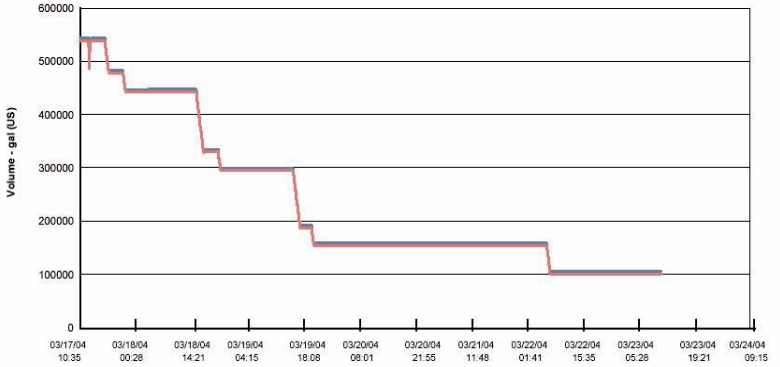
Tank.1.TankPoint — **Tank 1**

Test Result:

Calculated Leak Rate:	-1.949	gph (US)	Leak Threshold:	1.500	gph (US)
Test Result:	Failed		Certification Rate:	3.000	gph (US)

Test Data Summary:

Test Period Start Time:	02/15/2004 13:47		Minimum Temperature:	66.99	°F
Test Period End Time:	04/15/2004 13:47		Maximum Temperature:	69.21	°F
Test Period:	1440.00	hour	Delta Temperature:	2.23	°F
Product Level Used - Start:	11-09-02	ft-in-16th	Minimum Volume Used:	101,036.75	gal (US)
Product Level Used - End:	2-01-00	ft-in-16th	Maximum Volume Used:	538,798.69	gal (US)



Realtime Test Chart (03/17/04 10:35 to 03/23/04 11:00)

Tank Characteristics :

Date Installed:	January 01, 1970		Lining Material:	EC125U	
Tank Radius:	86-00-00	ft-in-16th	Construction Material:	Mild Steel	
Tank Length/Height:	13-00-00	ft-in-16th	Cathodic Protection:	Yes	
Tank Volume:	596,000.00	gal (US)	Overfill Protection:	Yes	
Automatic Tank Gauge:	Barton Model 3500 (Type3)		Spill Protection:	Yes	
Leak Detection System:	Version 6.0.0				

FuelsManager

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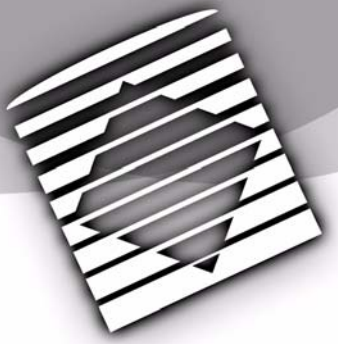
Real-Time Report

Command Summary

Tools ¦ Perform Leak Rate Analysis
Allows the user to perform Static and Continuous leak analysis tests



Working with the Throughput Calculator

(Professional Edition Only)

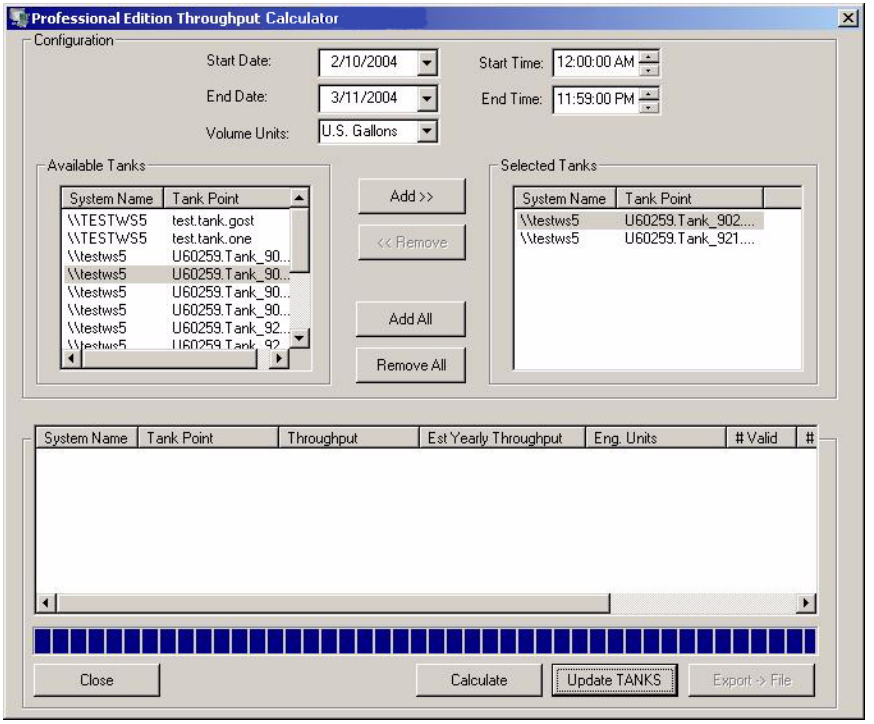
Understanding the Throughput Calculator

Note! The Throughput Calculator supports throughput calculations for Federal EPA requirements. State or local regulations may vary. Please consult the local emissions office for relevant requirements.

Title V of the 1990 Clean Air Act requires that all Major sources of air pollution obtain a new operating permit. Tank farms and terminals may be a major source of emissions, as such, they require a Title V permit. Operators have to estimate their total emissions each year. If this estimate is exceeded they are penalized very heavily. Typically, a software application developed by the EPA, called TANKS, is used to submit total emissions for Title V applications. The Throughput Calculator supplies throughputs to TANKS to reduce the amount of time and effort required by operators to calculate these values for the purpose of estimating total emissions. The Throughput Calculator uses volume increases for an individual tank, which is supplied by FuelsManager, to calculate the total throughput for a given time range.

Using the Throughput Calculator

Operators can perform an analysis by opening the Throughput Calculator interface. After opening the Throughput Calculator dialog box, all relevant criteria must be entered before an analysis can be generated.



Throughput Calculator dialog box

Fields	Description
Start Date	Defaults to the current date minus 30 days. Selecting the drop-down arrow will open a calendar for ease of selection.
End Date	Defaults to the current date. Selecting the drop-down arrow will open a calendar for ease of selection.
Start Time	Defaults to 12:00 PM
End Time	Defaults to 12:00 PM
Volume Units	Engineering units used for throughput calculation
Available Tanks	The available tanks in the current archive subsystem will be displayed in the Available Tanks list.

Fields	Description
Selected Tanks	The tanks selected by the user from the current archive subsystem will be displayed in the Selected Tanks list.
Calculated Values	All the results from the throughput calculation are shown in the Calculated Values list view. If multiple tanks have been selected, the control will display the results one row at a time as the analysis for a tank is completed.
Calculate	Button that Initiates a throughput analysis. The Calculate button is disabled until at least one tank has been selected.
Update TANKS	When the Update TANKS button is clicked, the Throughput Calculator will automatically populate the yearly throughput value in the TANKS software and the values for the date range selected - reducing the amount of manual calculations operators have to perform.
Export -> File/Abort	The Export/Abort button has two distinct functions, depending on the state of the application. If the Throughput Calculator is analyzing tank data, the button will be labeled Abort. Clicking this will immediately abort the current analysis operation. If the analysis is complete, the button will be labeled Export -> File. Clicking this will prompt the user for a filename and location for a "csv" formatted file.

Note! In order for the Throughput Calculator to export directly into TANKS software, the tank names used in FuelsManager must correspond exactly with the names used in the TANKS software. Varec recommends the naming convention in the TANKS software be changed to correspond with the naming convention used in FuelsManager.

Please consult an Administrator or Supervisor if there is concern of the current configuration of TANKS.

Performing Throughput Analysis

Step-by-Step

- From the Windows Start menu, select Programs.
- Select FuelsManager.
- From the FuelsManager program group select Throughput Calculator. The Throughput Calculator dialog box appears.
- Select the start and end dates for the throughput analysis.
- Select the start and end times for the throughput analysis.
- Select the type of volume units to be used in the calculation, display and exported files.
- The available tanks in the current archive subsystem will be displayed in the Available Tanks list. Add individual tanks to the selected list by highlighting the tank in the Available Tanks list and then either double-clicking or selecting the Add>> button.
- Click the Calculate button to start a throughput analysis. The same settings will be applied to all the selected tanks and the results will be displayed in the order the tanks are selected. The progress of the analysis is displayed in a bar below the Calculated Values list.

Note! Remove an individual tank by highlighting the tank in the Selected Tanks list and then either double-clicking or selecting the <<Remove button. To add or remove all of the tanks, use the Add All or Remove All buttons.

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